BARBER-GREENE

Operation & Maintenance Manual

SA145
Asphalt Paver

SA145X100 & Up

BG0104

WARRANTY

BARBER-GREENE

MANUFACTURER'S WARRANTY

Manufacturer (Barber Greene Company) warrants, commencing with the date of shipment to first end-user and for a period of 6 months thereafter or 1000 hours of operation, whichever occurs first, all machinery and parts manufactured by Manufacturer to be free from defects in workmanship and material. If, within such warranty period, any machinery or parts shall be proved to Manufacturer's satisfaction to be defective, it shall be repaired, or at the Manufacturer's option, replaced, F.O.B. Dealer's warehouse, without charge. Manufacturer's obligation hereunder shall be confined to such repair or replacement and does not include any charges, direct or indirect, for removing or replacing defective machinery or parts.

No warranty shall apply to used machinery nor to machinery, parts or accessories which have been furnished, repaired or altered by others so as, in Manufacturer's judgment, to affect the same adversely or which shall have been subject to negligence, accident or improper care, installation, maintenance, storage or other than normal use or service, during or after shipment. With respect to machinery, parts or accessories to Manufacturer's product which are furnished but not manufactured by Manufacturer, Manufacturer's warranty obligation shall in all respects conform and be limited to the warranty extended to Manufacturer by its supplier or, if none, to the warranties expressed herein.

No warranty shall apply to any portion of the Manufacturer's product adversely affected, in Manufacturer's judgment, by the use or installation on any product of the Manufacturer of any part, attachment or equipment not manufactured, sold or authorized by the Manufacturer.

Manufacturer further warrants that all services performed by it, including but not limited to advising services and services relating to installation or repair of machinery and parts thereof, will be performed in a good and workmanlike manner. Manufacturer's obligation and liability with respect to such warranty shall be limited to the amount received by it on account of such services or the amount reasonably allocable thereto.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES (EXCEPT OF TITLE) INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY; AND THE MANUFACTURER SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES WHATSOEVER, EITHER IN CONTRACT OR ON ACCOUNT OF NEGLIGENCE, WITH RESPECT TO MACHINERY, PARTS, ACCESSORIES OR SERVICES MANUFACTURED OR FURNISHED BY IT OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO. UNDER NO CIRCUMSTANCES SHALL THE MANUFACTURER BE LIABLE FOR ANY CONSEQUENTIAL OR OTHER DAMAGES, EXPENSES, LOSSES OR DELAYS HOWSOEVER CAUSED INCLUDING, WITHOUT LIMITATION, DAMAGES FROM DECREASE IN INCOME, INCREASE IN COSTS OF ANY DESCRIPTION OR DECREASE IN PROFITS, OR FROM FAILURE OF ANY PART OF THE MACHINERY FURNISHED HEREUNDER. ALL LIABILITY OF MANUFACTURER ON ACCOUNT OF NEGLIGENCE OR IN TORT IS HEREBY WAIVED BY DEALER AND PURCHASER. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

BARBER-GREENE COMPANY
OPERATION & SERVICE MANUAL

Date _____
Machine Serial No. _____
Power Unit Serial No. _____

MACHINE DELIVERY INSPECTION CHECK

	Pre-Delivery Inspection	100 Hr. Inspection
1. Unloading Machine		
a. Refer to Section A, pages A-2 & A-3		
2. Power Unit Check List		
a. Crank case oil level (dipstick mark)		
b. Crankcase drain plug tight		
c. Radiator coolant level (visual) 50/50% antifreeze		
d. Drain cock tight		
e. Hose clamps tight		
f. Oil filter properly installed		
g. (1) Fuel filter bowl clean		
g. (2) Fuel filter properly installed		
h. Generator or alternator properly installed		
i. Radiator and alternator fan belts tight (7/32 deflection midway between pulleys)		
j. Governor drive belts on gas engines (7/32 deflection midway between pulleys)		
k. Gages installed and operating properly		
l. Have engine dealer check engine		
(1) Engine speed set per Engineering specifications 2200 RPM. A I engines - RPM at full load. Low idle 1000 RPM.		
m. Start engine check for following:		
(1) No leaks, fuel, oil, water or air in engine		
(2) No leaks in hydraulic system		
n. Air cleaner per engine manual		
o. Battery - check terminal connections & fluid level		
3. Transmission(s) Check List		
a. Oil level to (dipstick mark, plugs or sight gage)		
(1) Feeder drive reducers (2)		
(2) Crawler gear box (2)		
(3) Crawler Drive 3-Speed Box		
b Drain plugs tight		
c Mounting bolts tight		
d. Cover bolts tight		
e. Breathers installed		
f. Ease of shifting and noise level		
4. Chain Drives Aligned, Tightened and Adjustments Locked per OSM		
a. Crawler final drive		
b Feeder final drive		
c Screw final drive		
d. Feeder countershaft drive		
e. Adjustments locked		

	Pre-Delivery Inspection	100 Hr. Inspection
5. Screed Unit		
a Check blower operation		
b Check screed burner ignition, both sides		
6. Belt Drives Aligned and Tightened per Owners Manual		
a. Adjustments locked		
7. Feeder Operation		
a. Flight chains properly installed - drag bars laying flat on drag pans		
b. Chains running free & conveying properly		
c. Take-up adjustments even on both sides		
d. Adjustments locked		
8. Screws		
a. Screws matched and running free		
b. Conveying properly (rotation & correct hand)		
c. Size and type per order specification		
9. Clearance of all Moving Parts		
a. Push rollers free and frame straight		
b Clearance between hoppers and mainframe		
c. Clearance between flight chains and chain guard 7/16" approximately		
d. Feeder gates free		
e. Screed travel support ease of operation		
10. Brakes		
a. Parking brake properly adjusted		
11. Tractor Hydraulic System		
a. Strainer in hydraulic tank (filler & vent)		
b. Oil level in hydraulic tank to (¾ height of sight gauge with oil at room temp.), Level light out.		
12. Hydraulic System Pressures (pressures at 1875 pump speed)		
a. Vibratory drive relief valve - 1500 PSI		
b. Tractor circuit relief valve - 1750 PSI		
c. Automatic screed control circuit relief valve - 600 PSI		
d. Feeder drive circuit relief valve - 4000 PSI		
e. Propel circuit relief valve - 5000 PSI		
NOTE: ± 5% tolerance in pressures and RPM's		
13. Hydraulic System Check		
a. Recheck oil level, add oil if required (Mobile 300 or equivalent)		
b. Operation of hydraulic cylinders		
c. Hydraulic hose clamped or taped free of all moving parts		
d No hydraulic leaks in system		
14. Automatic Leveling		
a. Full proportional control system		
b. Right and left hand wiring harness, wires marked, C and D to right hand grade control valve and, E and F to left hand grade control valve.		
c. No leaks in automatic leveling hydraulic		

	Pre-Delivery Inspection	100 Hr Inspection
15. Electrical System		
a. Check hopper switches up-down position		
b. Feeder switches on-off position (manual and automatic) (start-stop switch in start position for automatic)		
c. Screed hoist switches up-down and hold position		
d. Sensors for feeder control paddles should be on when paddle is down and off when paddle is up.		
e. No paint on terminal connections		
f. Wiring free of all moving parts		
16. Screed Unit Adjustments		
a. No excessive binding between screed and mainframe when raised to travel position		
b. Check leveling arm where attached to screed		
17. Visual Check of Bearing Lubrication (tractor unit) (Refer to Sect on G, Lubrication)		
18. Anti-friction bearings used on the finisher have been lubricated by supplier. The grease cannot be seen since it is concealed within the bearings by the grease retainer rings. These bearings used on the screw-feeder counter shaft, and screw-feeder counter shaft, and screw conveyor, are not to be greased prior to delivery.		
19. Spare Parts		
a. Seat support fits and is square to frame		
b. End plate supports fit with no interference		
c. Set screw installed in end support guides, steering gauge and support pipes work freely		
NOTE: Check all loose parts against manifest and for proper fit up before delivery to customer		
20. Special G.O. Items		
a. Layton truck hitch operates correctly		
b. Variable strike-off operates correctly		

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RECEIVING MACHINE

Your Barber-Greene Finisher was thoroughly tested, carefully inspected, and properly loaded at the factory. The entire shipment including loose parts was thoroughly checked before it was released to the transportation company.

Upon receipt of the machine, before unloading, carefully inspect for any loss or damage that may have occured during transportation. It would be well to check it against your shipping manifest which will be found in the tool box.

If any loss or damage is discovered, you will save time by immediately notifying the transportation company's agent who will give you the proper forms for making a claim.

Your dealer service department will instruct your personnel in the correct operation and care of this machine, at no additional cost to you.

Should the machine not have started operation at the time of delivery, your dealer will consider it a favor if you will contact him when ready to operate so he can supervise the initial operation.

A few days notice, if possible, will help him greatly in his planning. DO NOT START THE ENGINE until you have read and understand the section on starting procedure - Section C.

SAFETY

READ THIS OPERATION AND SERVICE MANUAL

KNOW WHAT YOU'RE DOING

Safety is basically common sense. There are standard safety rules but each situation has its own peculiarities which cannot always be covered by rules. Therefore, be ever watchful for safety hazards and correct deficiencies promptly.

Lack of attention to the notes and instructions in this manual can result in: accidents, personal injury, reduction in efficiency and – worst of all – loss of life.

A careful operator is the best insurance against an accident.

THE COMPLETE OBSERVANCE OF ONE SIMPLE RULE WOULD PREVENT MANY THOUSAND SERIOUS ACCIDENTS EACH YEAR.

THAT RULE IS:

Never Attempt to Clean, Oil, or Adjust any Machine While it is in Motion

UNLOADING MACHINE

REMOVE ALL WIRES, BANDS AND BLOCKING

Read and understand the controls and starting procedure. (Refer to Section C).

BY CRANE

The best and easiest method to unload the Finisher is by overhead crane if one is available.

It must be able to handle approximately 14 tons. Hook up cable or chains to lifting rings as shown in Figure A-1, below.

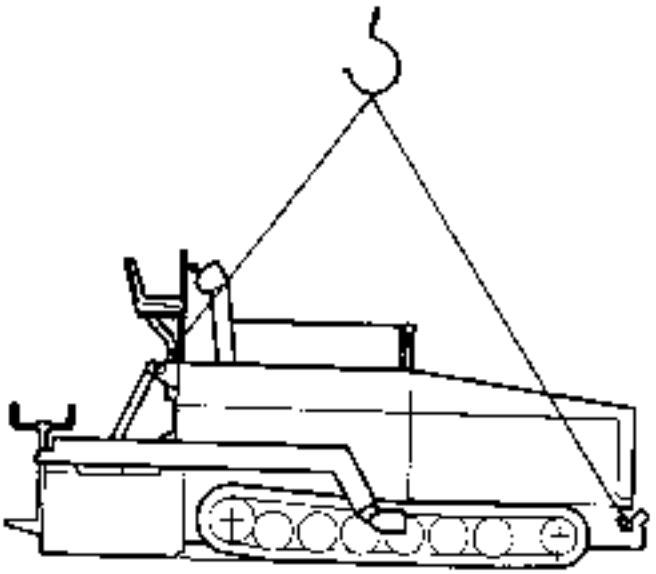

FIGURE A-1

TO PLATFORM

If the Finisher is to be unloaded on a platform, be sure the platform will support the weight of the machine.

Bridge the gap between car and platform with 6" x 12" oak timbers.

Raise the Finisher screed so it rests on the arm stops.

Maneuver machine around on car and align wheels with planks, hopper end of the machine forward, and drive off on to platform using lowest operating speed. Engine at full throttle.

BY TEMPORARY RAMP.

If a crane or platform is not available it will be necessary to construct a ramp. It should be carefully planned and constructed.

Construct the ramp at the end of the car, if possible, and about 30' in length. Use eight 4" x 12" planks, 16' long for the wheel runways.

Crib up underneath the planks with railroad ties and small blockings so that at no point are the planks unsupported for over 3' of their length.

About 5 lbs. of 60 penny spikes are necessary to tie ramp together solidly and about 32 ties will be needed for cribbing.

Make certain that the lower 6 feet of the ramp incline does not have a pitch exceeding 1½" per foot, or 9 inches for the 6 feet, as the front of the machine will not clear, or the spreading screws may be damaged as the machine comes off the ramp. See Figure A-2.

CAUTION: If planks are not available for the runways and ties are used, be sure to use dry ties, as creosoted ties are slippery and dangerous.

If only creosoted ties are available, use sand on them to prevent slipping.

Block car so it cannot move either way as the machine is being run off and set car brakes to insure safety.

RUNNING MACHINE DOWN RAMP

Be sure the screed is raised and rests on the arm stops.

Run machine down ramp, hopper end forward in the direction of forward travel. Perfectly align wheels with runway planks so that steering will not be necessary once the machine is started down the ramp. Use lowest operating speed. Engine at full throttle.

NOTE: A snubbing line attached to the rear of the screed frame to prevent the machine from "getting away" is always a good safety measure to use.

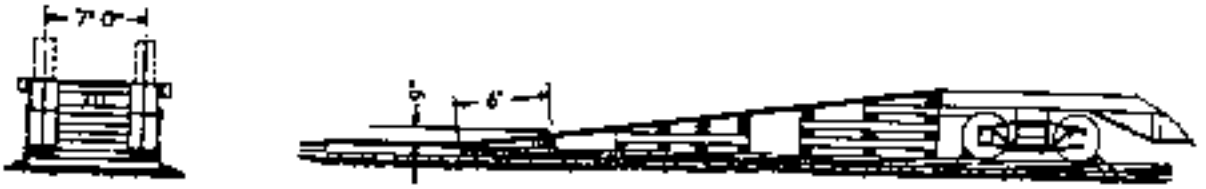

FIGURE A-2

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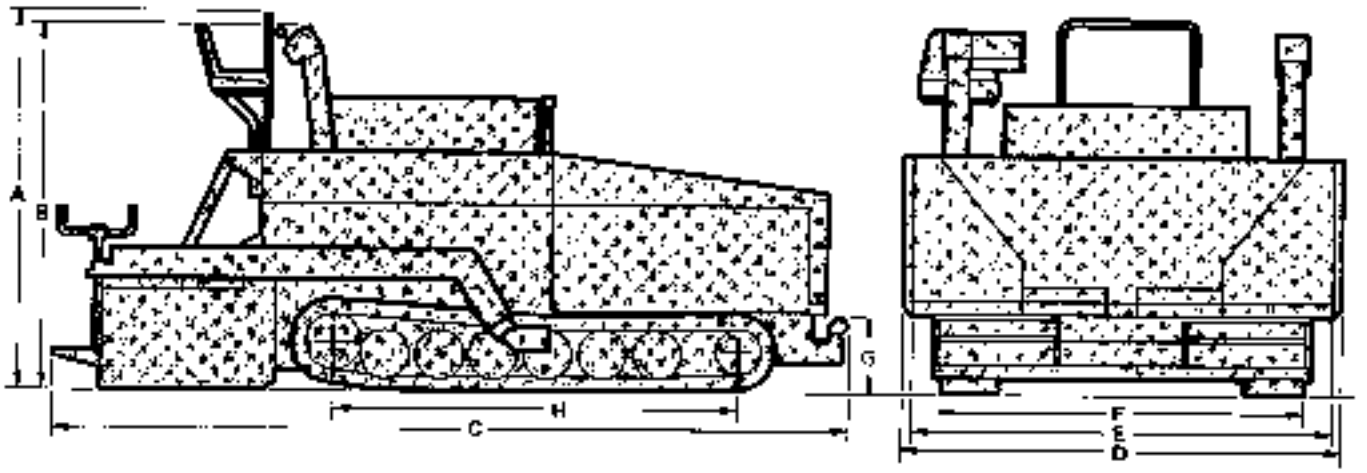
MODEL SA-145 ASPHALT FINISHER



	U.S. SYSTEM	METRIC SYSTEM
DIMENSIONS:		
A. Height (less muffler)	8'-4"	2,54 m
B. Height (min. shipping)*	8'-4"	2,44 m
C. Length, overall	18'-4"	5,59 m
D. Width, operating	10'-6"	3,20 m
E. Width, shipping	10'-0"	3,05 m
F. Crawler width—to outside of crawler pads	8'-10½"	2,70 m
G. Truck dumping clearance	2'-½"	63 cm
H. Crawler centerline to centerline	9'-3"	2,82 m
WEIGHTS:		
Standard machine, approximate	27,500 lbs.	12,28 kg
Screed extensions:		
6" (15,2 cm)	130 lbs.	59 kg
1'-0" (30,5 cm)	216 lbs.	98 kg
2'-0" (61 cm) without heat	430 lbs.	195 kg
2'-0" (61 cm) with heat	495 lbs.	225 kg
5'-0" (152,4 cm) with heat	1220 lbs.	544 kg

* May be reduced to 8'-4" by removing operator stations and rails.

	U.S. SYSTEM	METRIC SYSTEM
OPERATION:		
Paving width:		
Standard	10'-0"	3,05 m
With cut-off shoes	8'-0"	2,44 m
With Extensions	28'-0"	8,53 m
Paving thickness range: (non-adj. screws)	½"-8"	5 to 20,3 cm
Hopper size (Enclosed Volume)	201 C.F.	5.7 m³
Maximum paving speeds (dependent on width and thickness of mat, grade, etc.).		
Low range: up to	84 FPM	26 m/min.
Intermediate range: up to	220 FPM	67 m/min.
Maximum travel speed: Forward or reverse at 2200 RPM	6.4 MPH	10.33 k/hr.

POWER UNIT: John Deere Model 4276 T (turbocharged) diesel engine, 4 cylinders developing 95 H.P. at 2200 RPM complete with oil filter and air cleaner.

FUEL TANK: 43 gals. (163 liter)

POWER TRANSMISSION: Full hydrostatic propel and feeder drive through heat treated alloy gears and shafts in oil tight gear cases. Feeders operate independently of paving speed, and are variable speed.

SUSPENSION SYSTEM: Steel tractor type track with rubber pads. Track rail and pins and track tensioner utilized on Fiat-Allis FL4D loader. Rubber track pads are 14" x 5" and secured to the track with 2 nuts and bolts. Hydrostatic drive permits one crawler to be run forward while the other is in reverse. Anti-friction bearings in track wheels provide 1000 hr. operation between service periods.

HOPPERS AND FEEDERS: Self-dumping 10'-6" (3.2 m) wide operated by two hydraulic cylinders. Twin variable speed feeders operate independently of each other and forward speed. Feeders made up of two strands of special block chain with forged steel bars sliding over drag pans of abrasion resistant steel. Two separately operated flow gates. 12" (30,5 cm) diameter spreading screws are full cast ni-hard steel.

CONTROLS: Precise power steering through crawlers. Seat may be moved to either station. Movable control panel provides fingertip control of dumping hoppers, manual override for automatic feeders and screws, horn, screed hoist, screed drive and engine emergency stop button, from either station. Mechanical parking brake at each station. Vandal covers for control panel and engine instruments.

OSCILLATING PUSH ROLLERS: Push roller mounting compensates for truck misalignment when contacting finisher.

INSTRUMENTS: Standard equipment includes engine temperature, hydraulic oil temperature, oil pressure, ammeter, tachometer with hourmeter and keyed ignition switch.

Electrical system includes 12 volt heavy duty battery, alternator with manual reset circuit breakers located in central instrument panel.

Page 6958 MODEL SA-146 FINISHER (Cont.)

BARBER-GREENE SPECIFICATIONS

SCREED: Two piece basic screed 10' (3,05 m) wide includes cut-off shoes for reducing laying width up to 24" (61 cm) in 3" (7,6 cm) increments. Screed is heated by two fuel oil burners with electric ignition. Frequency of vibration adjustable up to 2600 CPM. Pressurized fuel oil system with nozzle and hose provided for paver cleanup. Crown adjustable from 3" (7,6 cm) positive to 1" (2,54 cm) negative. Four eccentric vibrators are hydraulically driven.

PROPORTIONAL MICRO-GUIDE (Joint Matcher): Designed to match a longitudinal reference such as a previously laid mat, gutter, or other external reference, such as a Leveler. Does not provide automatic control of transverse slope. Functions from either side of paver. Optional additional sensor for "twin" operation available.

OPTIONS AND ACCESSORIES

SCREED EXTENSIONS: Available to widen laying width from 10' (3,05 m) to 28' (8,53 m). Extensions of 6" (15,2 cm), 1' (30,5 cm), and 2' (61 cm) and 5' (152,4 cm) available. Vibrator provided for 2' (61 cm) and 5' (152,4 cm) extension which can also be provided with heating unit if required.

PROPORTIONAL HONEYWELL AUTOMATIC SCREED CONTROLS: Provides full proportional control for both longitudinal grade and transverse slope when operating to one reference. System provides utmost accuracy, in that correction response is directly related to the magnitude of error. Functional from either side of paver, control system provides both grade and slope controller. Slope controller automatically maintains preset slope including wide width screed 28'. Optional additional grade controller available for "twin" operation.

LEVELER: 30' (9,14 m) Traveling Grade Reference: Consists of pin connected random length aluminum beams, mounted on eight dual runner skids. Provides a mean average of surface on which it is operating. Also available in 40' (12,2 m).

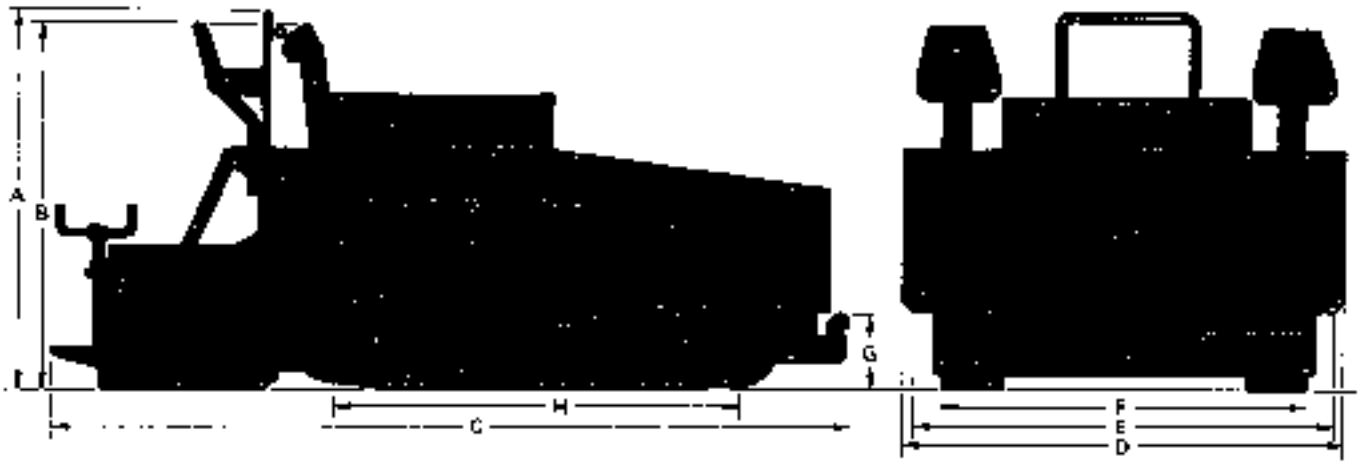
BEVEL END PLATES: Plates fasten to end of screed or screed extensions and are used to bevel edge of mat.

ADDITIONAL CONSOLE AND OPERATOR'S SEAT: Includes console and operator's seat for opposite side of paver.

LAYTON TRUCK HITCH: Hydraulically locks paver to truck. A central sliding pivot connection provides excellent steering maneuverability.

BARBER-GREENE T.M.
Anticipating Tomorrow

MODEL SA-145 ASPHALT FINISHER



	U.S. SYSTEM	METRIC SYSTEM
DIMENSIONS:		
A. Height (less muffler)	8'-4"	2,54 m
B. Height (min. shipping)*	8'-4"	2,44 m
C. Length, overall	18'-4"	5,59 m
D. Width, operating	10'-6"	3,20 m
E. Width, shipping	10'-0"	3,05 m
F. Crawler width—to outside of crawler pads	8'-10½"	2,70 m
G. Truck dumping clearance	2'-½"	63 cm
H. Crawler centerline to centerline	9'-3"	2,82 m
WEIGHTS:		
Standard machine, approximate	28,500 lbs.	12,28 kg
Screed extensions:		
6" (15,2 cm)	130 lbs.	59 kg
1'-0" (30,5 cm)	215 lbs.	98 kg
2'-0" (61 cm) without heat	430 lbs.	195 kg
2'-0" (61 cm) with heat	496 lbs.	225 kg
5'-0" (152,4 cm) with heat	1220 lbs.	544 kg

*May be reduced to 8'-4" by removing operator stations and rails.

	U.S. SYSTEM	METRIC SYSTEM
OPERATION:		
Paving width:		
Standard	10'-0"	3,05 m
With cut-off shoes	6'-0"	2,44 m
With Extensions	28'-0"	8,53 m
Paving thickness range: (non-adj. screws)	½"-8"	0,8 to 20,3 cm
Hopper size (Enclosed Volume)	201 C.F.	5,7 m³
Maximum paving speeds (dependent on width and thickness of mat, grade, etc.):		
Low range: up to	84 FPM	26 m/min
Intermediate range: up to	220 FPM	67 m/min
Maximum travel speed: Forward or reverse at 2200 RPM	6.4 MPH	10,23 k/hr.

POWER UNIT: John Deere Model 4276 T (turbocharged) diesel engine, 4 cylinders, developing 95 H.P. at 2200 RPM complete with oil filter and air cleaner.

FUEL TANK: 43 gals. (163 liter)

POWER TRANSMISSION: Full hydrostatic propel and feeder drive through heat treated alloy gears and shafts in oil tight gear cases. Feeders operate independently of paving speed, and are variable speed.

SUSPENSION SYSTEM: Steel tractor type track with rubber pads and hydraulic take-up for constant proper tension. Rubber track pads are 14" x 5" and secured to the track with 2 nuts and bolts. Hydrostatic drive permits one crawler to be run forward while the other is in reverse. Anti-friction bearings in track wheels provide 1000 hr. operation between service periods.

SELF-REGULATING FEEDERS AND HOPPER: Hydrostatically driven feeders operate independently of each other and forward paving speed. Feeders, once properly set, never stop while Finisher is paving but automatically increase or decrease their speed to match the material demand at the screed. Feeders are made up of two strands of special block chain with forged steel bars sliding over a bed plate of abrasion resistant alloy steel. Self-dumping hopper 10'6" (3,2m) wide, is operated by two hydraulic cylinders. Mechanical feeder gates are standard. 12" (30,5 cm) diameter spreading screws are full cast ni-hard steel.

CONTROLS: Precise power steering through crawlers. Two complete consoles, seats, and parking brakes are furnished. Control panels provide fingertip control of dumping hoppers, throttles, manual override for automatic feeders and screws, horn, screed hoist, screed down and engine emergency stop button. Horn other station. Vandal covers for control panel and engine instruments.

OSCILLATING PUSH ROLLERS: Push roller mounting compensates for truck misalignment when contacting finisher.

INSTRUMENTS: Standard equipment includes engine temperature, hydraulic oil temperature, oil pressure, ammeter, tachometer with hourmeter and keyed ignition switch.

Page 6956 MODEL SA-145 FINISHER (Cont.)

BARBER-GREENE SPECIFICATIONS

Electrical system includes 12 volt heavy duty battery, alternator with manual reset circuit breakers located in central instrument panel

PROPORTIONAL MICRO-GUIDE (Joint Matcher): Designed to match a longitudinal reference such as a previously laid mat, gutter, or other external reference, such as a Leveler, but does not provide automatic control of transverse slope. Functions from either side of paver. Optional additional sensor for "twin" operation available.

PAINT: Two coats of high grade enamel applied over a clean shot blasted surface for maximum protection and durability.

VIBRATORY SCREED

SCREED PLATE: Two piece basic screed 10' (3,05 m) wide includes cut-off shoes for reducing laying width up to 24" (61 cm) in 3" (7,6 cm) increments. Screed is 24" wide, ½" thick, abrasion resistant alloy steel, beveled on both ends, and bolted to frame. They are reversible for long wear. Screed is heated by two fuel oil burners with electric ignition using same fuel oil supply as engine. Pressurized fuel oil system with nozzle and hose provided for convenient paver clean-up.

VIBRATORS: Vibrators are hydraulically driven and mechanically interlocked for uniform "in-phase" operation. Anti-friction bearings are used throughout. Frequency of vibration is adjustable up to 2,600 C.P.M. Four eccentrics provide the vibration on the screed.

DUAL CROWN CONTROL: Adjustable from 3" (7,6 cm) positive to 1" (2,54 cm) negative crown. Leading and trailing edges of the screed may be crowned independently. Controls are tied together with roller chain and sprockets, and are supported by roller bearings on crown towers.

OPTIONS AND ACCESSORIES

SCREED EXTENSION: Available to widen laying width from 10' (3,05 m) to 28' (8,53 m). Extensions of 6" (15,2 cm), 1' (30,5 cm), and 2' (61 cm) available. Vibrator provided for 2' (61 cm) extension which can also be provided with heating unit if required.

PROPORTIONAL AUTOMATIC SCREED CONTROLS: Provides full proportional control for both longitudinal grade and transverse slope when operating to one reference. System provides utmost accuracy, in that correction and response is direcly related to the magnitude of error. Functional from either side of paver, control system provides both grade and slope controller. Slope controller automatically maintains preset slope including wide width screed 28'. Optional additional grade controller available for "twin" operation.

LEVELER: 30' (9.14 m) Traveling Grade Reference: Consists of pin connected random length aluminum beams, mounted on eight dual runner sleds. Provides a mean average of surface on which it is operating. Also available in 40' (12,2 m)

BEVEL END PLATES: Plates fasten to end of screed or screed extensions are used to bevel edge of mat.

EXTEND-A-MAT SCREED: A variable width screed that enables operator to hydraulically vary paving widths with full heat, vibration, and compaction with the flip of a switch.

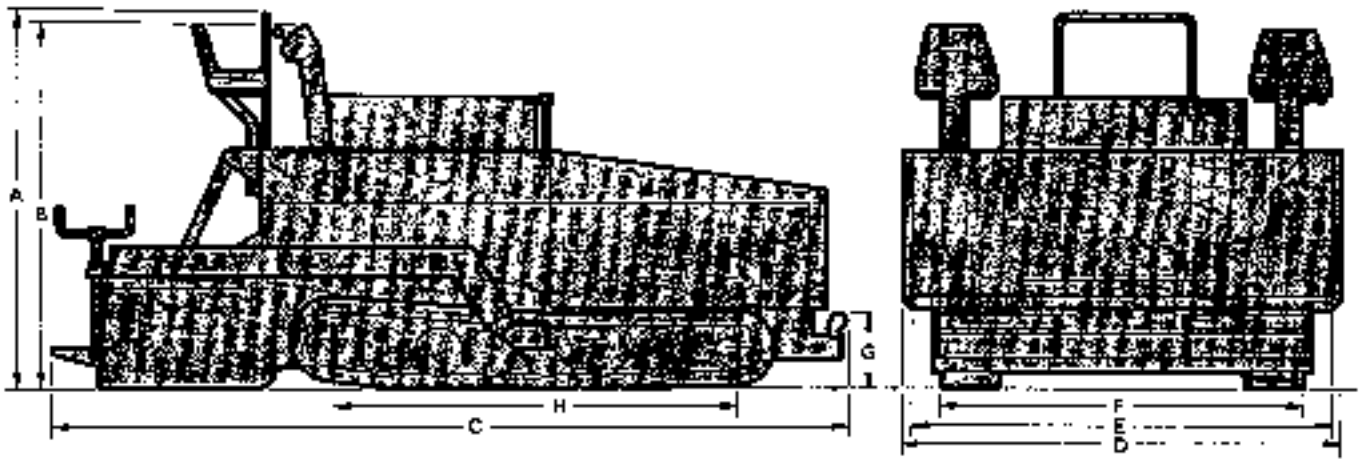
GMC DIESEL ENGINE: Model 3-53T, 124 H.P. @ 2,200 R.P.M with sound suppression.

VARIABLE STRIKE-OFF: 3' extensions on each side, hydraulically operated

LAYTON QUICK HITCH: For positive truck hook-up.
Advantages: Eliminates truck spillage.
Positive paver control.
Reduces maintenance costs.
More truck cycles per day.

BARBER-GREENE

MODEL SA-145 ASPHALT FINISHER



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	U.S. SYSTEM	METRIC SYSTEM
OPERATION:		
Paving width:		
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With cut-off shoes	7'-0"	2,13 m
With Extensions	28'-0"	8,53 m
Paving thickness range: (non-adj. screws)	½"-8"	0.6 to 20,3 cm
Hopper size (Enclosed Volume)	201 C.F.	5.7 m³
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POWER TRANSMISSION: Full hydrostatic propel and feeder drive through heat treated alloy gears and shafts in oil tight gear cases. Feeders operate independently of paving speed, and are variable speed.

SUSPENSION SYSTEM: Steel tractor type track with rubber pads and hydraulic take-up for constant proper tension. Rubber track pads are 14" x 5" and secured to the track with 2 nuts and bolts. Hydrostatic drive permits one crawler to be run forward while the other is in reverse. Anti-friction bearings in track wheels provide 1000 hr. operation between service periods.

SELF-REGULATING FEEDERS AND HOPPER: Hydrostatically driven feeders operate independently of each other and forward paving speed. Feeders, once properly set, never stop while Finisher is paving but automatically increase or decrease their speed to match the material demand at the screed. Feeders are made up of two strands of special block chain with forged steel bars sliding over a bed plate of abrasion resistant alloy steel. Self-dumping hopper 10'6" (3,2m) wide, is operated by two hydraulic cylinders. Mechanical feeder gates are standard. 12" (30,5 cm) diameter spreading screws are full cast ni-hard steel.

CONTROLS: Precise power steering through crawlers. Two complete consoles, seats, and parking brakes are furnished. Control panels provide fingertip control of dumping hoppers, throttles, manual override for automatic feeders and screws, horn, screed hoist, screed drive and engine emergency stop button, from either station. Vandal covers for control panel and engine instruments.

OSCILLATING PUSH ROLLERS: Push roller mounting compensates for truck misalignment when contacting finisher.

INSTRUMENTS: Standard equipment includes engine temperature, hydraulic oil temperature, oil pressure, ammeter, tachometer with hourmeter and keyed ignition switch.

Electrical system includes 12 volt heavy duty battery, alternator with manual reset circuit breakers located in central instrument panel.

PROPORTIONAL MICRO-GUIDE (Joint Matcher): Designed to match a longitudinal reference such as a previously laid mat, gutter, or other external reference, such as a Leveler, but does not provide automatic control of transverse slope. Functions from either side of paver. Optional additional sensor for "twin" operation available.

PAINT: Two coats of high grade enamel applied over a clean shot blasted surface for maximum protection and durability.

VIBRATORY SCREED

SCREED PLATE: Two piece basic screed 10' (3,05 m) wide includes cut-off shoes for reducing laying width up to 24" (61 cm) in 3" (7,6 cm) increments. Screed is 24" wide, ½" thick, abrasion resistant alloy steel, beveled on both ends, and bolted to frame. They are reversible for long wear. Screed is heated by two fuel oil burners with electric ignition using same fuel oil supply as engine. Pressurized fuel oil system with nozzle and hose provided for convenient paver clean-up.

VIBRATORS: Vibrators are hydraulically driven and mechanically interlocked for uniform "in-phase" operation. Anti-friction bearings are used throughout. Frequency of vibration is adjustable up to 2,600 C.P.M. Four eccentrics provide the vibration on the screed.

DUAL CROWN CONTROL: Adjustable from 3" (7,6 cm) positive to 1" (2,54 cm) negative crown. Leading and trailing edges of the screed may be crowned independently. Controls are tied together with roller chain and sprockets, and are supported by roller bearings on crown towers.

OPTIONS AND ACCESSORIES

SCREED EXTENSION: Available to widen laying width from 10' (3,05 m) to 28' (8,53 m). Extensions of 6" (15,2 cm), 1' (30,5 cm), and 2' (61 cm) available. Vibrator provided for 2' (61 cm) extension which can also be provided with heating unit if required.

PROPORTIONAL AUTOMATIC SCREED CONTROLS: Provides full proportional control for both longitudinal grade and transverse slope when operating to one reference. System provides utmost accuracy, in that correction and response is directly related to the magnitude of error. Functions from either side of paver, control system provides both grade and slope controller. Slope controller automatically maintains preset slope including wide width screed 28'. Optional additional grade controller available for "twin" operation.

LEVELER: 30' (9,14 m) Traveling Grade Reference: Consists of pin connected random length aluminum beams, mounted on eight dual rubber sleds. Provides a mean average of surface on which it is operating. Also available in 40' (12,2 m).

BEVEL END PLATES: Plates fasten to end of screed or screed extensions are used to bevel edge of mat.

MODEL 1020 EXTEND-A-MAT™ SCREED: A variable width screed for paving from 10'-0" (3,048m) to 19'-6" (5,94m) wide. Features two integral 4'-9" (1,45m) extender screeds behind 10'-0" (3,048m) front screed. Heat and vibration provided on front screed and extender screeds. 18" (45,7cm) screed plates used throughout. Solid 1'-0" (30,48cm) and 2'-4" (71,1cm) screed extensions available for paving up to 24'-2" (7,37m) wide.

GMC DIESEL ENGINE: Model 3-53T, 124 H.P. @ 2,200 R.P.M. with sound suppression.

VARIABLE STRIKE-OFF: 3' extensions on each side, hydraulically operated.

LAYTON QUICK HITCH: For positive truck hook-up.
Advantages: Eliminates truck spillage.
Positive paver control.
Reduces maintenance costs.
More truck cycles per day.

BARBER-GREENE T.M.

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USE OF CONTROLS

The operator should thoroughly familiarize himself with the instruments and controls provided for operation.

POWER UNIT

There are important differences between various engines; therefore, regardless of previous experience with other power units, the operator will obtain the best results if he fully understands what each control is for and how to use it. (See Engine Operator's Manual furnished in addition to this manual.)

BEFORE STARTING ENGINE

Check the following before starting engine to avoid possible damage:

1. RADIATOR — Should be filled with anti-freeze solution. (shipped from the factory with 50% water, 50% anti-freeze.)
2. CRANKCASE — Check oil level, oil should be up to level indicated on dip stick.
3. BATTERY — Check water level.
4. FUEL — Check for fuel.

IMPORTANT: Drain water from tank weekly

5. A visual inspection should be made to see that all grease points have been lubricated, that the fluid levels are correct and the paver is ready for operation. (Refer to Lubrication, Section G.)

IMPORTANT: Visually inspect the crawler track bolts at first 30 and 100 hours of operation and check every 1000 hours thereafter retighten if necessary.

TO START ENGINE

1. Refer to Engine Manufacturer's Manual for start-up procedure.
2. Be sure all switches and components are in off or disengage position before starting engine.
3. Set hand brakes.
4. Move steering/speed levers to neutral position.
5. Turn engine start switch, located on the instrument panel, to start engine.

THROTTLE LEVER (Refer to Figure C-1)

Located at both operator stations to control engine speed.

To Open — Pull Lever Back.
To Close — Push Lever Forward.

SPEED SELECTOR LEVER

Located at both operator stations to determine crawler speed for travel or paving. Lever has three positions.

1 — Pave 0 to 84.4 FPM
2 — Inter 0 to 220.2 FPM
3 — Trav. 0 to 559.4 FPM (6.4 MPH)

HAND BRAKE LEVER (Refer to Figure C-1)

Located at both operator stations and applied when parking the machine, starting the engine and shifting the Speed Selector Lever. The lever engages the brakes on the Crawler Drive 3-Speed Boxes.

SCREED LOCK LEVER (Refer to Figure C-1)

Located in the deck next to both operator stations to hold screed in the up position for travel.

To support screed:

1. With screed raised, move Lock Lever toward center of machine, or "LOCK" position.
2. Lower screed by putting toggle switch in the down position until leveling arms rest on the supports.

NOTE: When screed is resting on leveling arm support, the screed must be raised slightly to permit support locks to be moved.

To Lower Screed:

1. Push screed lift switch forward while moving Leveling Arm Lock lever outward or "free" position.
2. Move screed lift switch to down position, lowering screed.

SCREED LIFT CONTROL SWITCH (Refer to Figure C-2)

Located on the operating control panel. Three position switch to raise, hold and lower screed.

SCREED DRIVE CONTROL SWITCH (Refer to Figure C-2)

Located on operating control panel. Two position on/off switch determining whether screed compacting mechanism is on or off.

FEEDER CONTROL SWITCHES (Refer to Figure C-2)

Two switches located on the operating control panel are used to control feeder conveyors and augers. Independent switches for both feeders have automatic, manual and off position.

1. Automatic Position — Feeder and auger speed will be determined by the position of the feeder paddles.

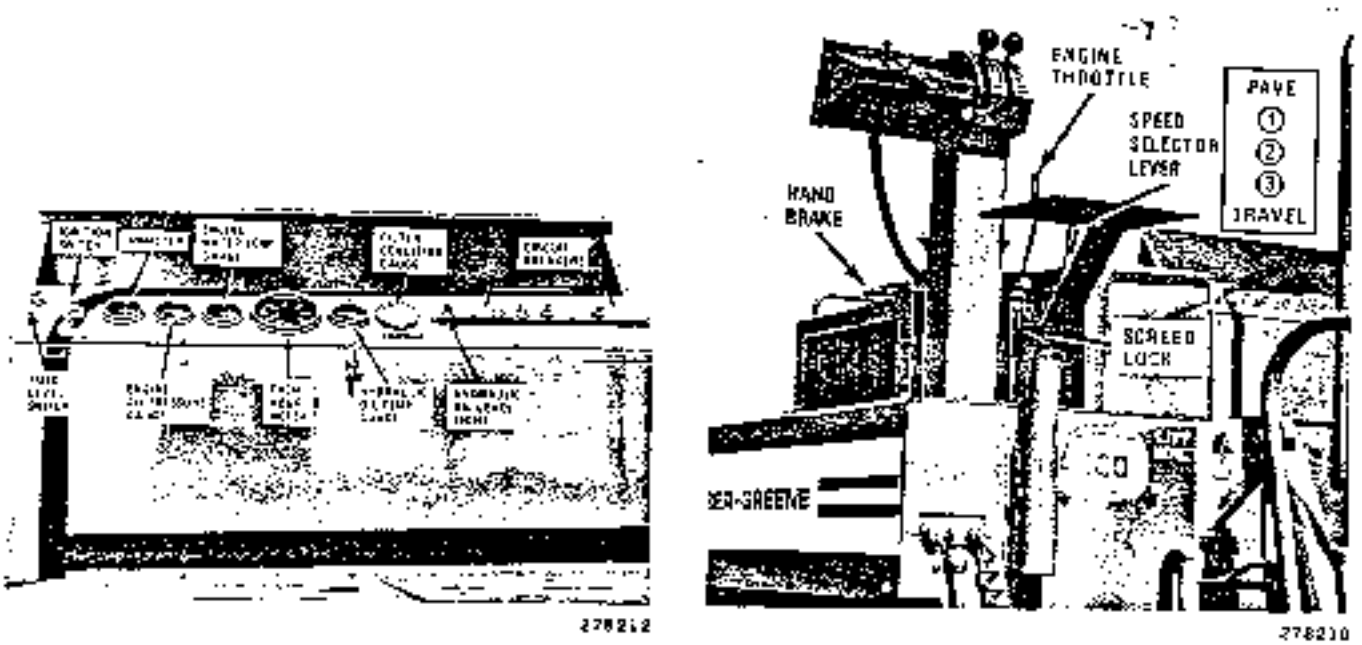


FIGURE C-1 — Levers and Instrument Panel

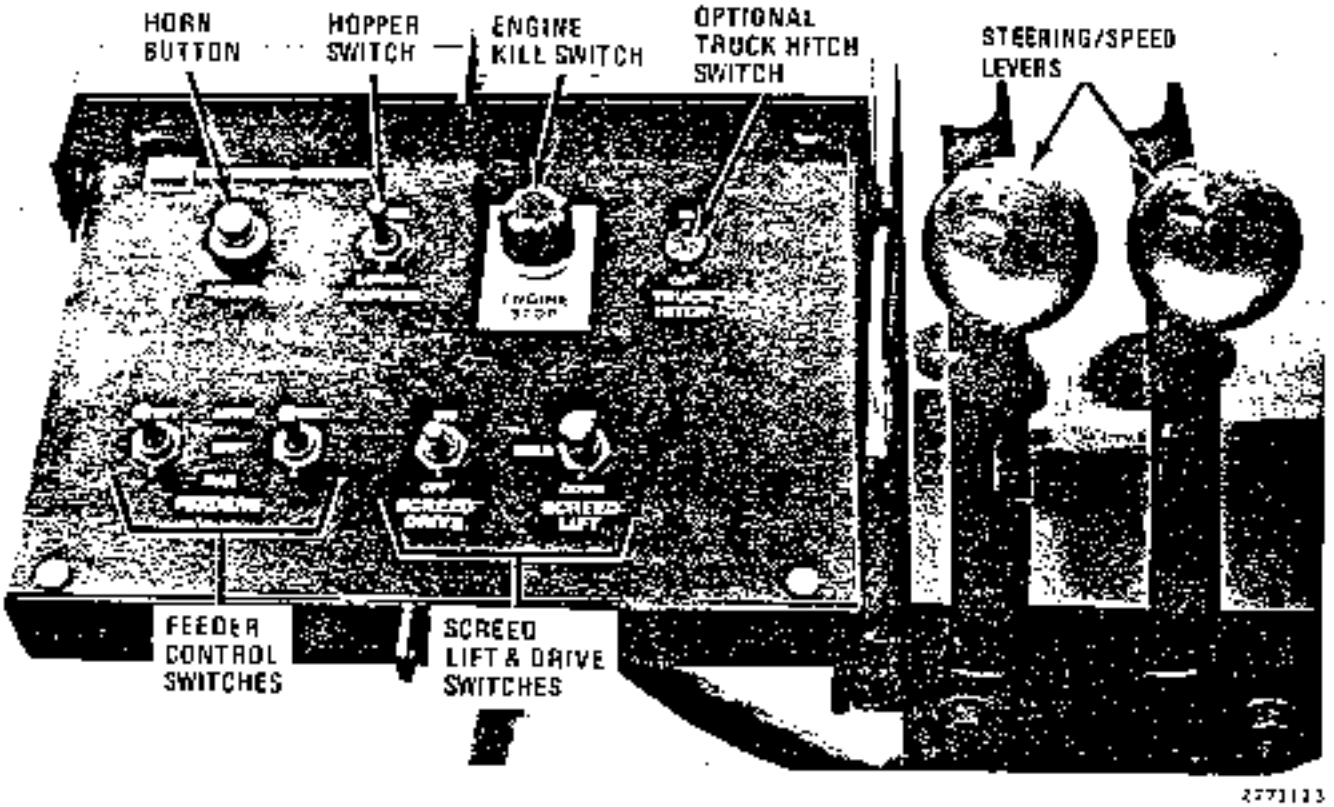


FIGURE C-2 — Operator's Control Panel

2. Manual Position — Switch held in manual position will operate feeders at full speed.
3. Off Position — Switch in off position will stop feeders.

HOPPER RAISE AND LOWER SWITCH (Refer to Figure C-2)

Located on the operating control panel and used to raise and lower hopper.

STEERING/SPEED LEVER (Refer to Figure C-2)

There is a steering/speed control lever for each crawler. These levers control the forward and reverse speed. They are also used to steer the machine.

Push Levers Forward from Neutral — Machine moves Forward.

Pull Levers Backwards from Neutral — Machine moves in Reverse.

While moving forward:

To Steer to the Right — Push the Left Lever Forward.

To Steer to the Left — Push the Right Lever Forward.

To Steer in reverse while seated at the controls.

While moving in Reverse:

To Steer to the Right — Pull the Left Lever Back.

To Steer to the Left — Pull the Right Lever Back.

EMERGENCY STOP BUTTON (Refer to Figure C-2)

Located on the operator control panel and used for emergency engine kill, to stop engine.

TRAVEL PROCEDURE (Refer to Figure C-3)

CAUTION: For all grade travel, ALWAYS set hand brakes before shifting speed selector lever.

An unsafe operating condition could develop if an attempt is made to shift the gears of an SA-145 Paver, while the machine is in motion, on grade.

The SA-145 has three gears, two paving and one travel. Control of speed, steering and stopping the machine, are accomplished through the transmission. As a result, normal operation does not require use of the brake system, other than to hold the machine while shifting gears.

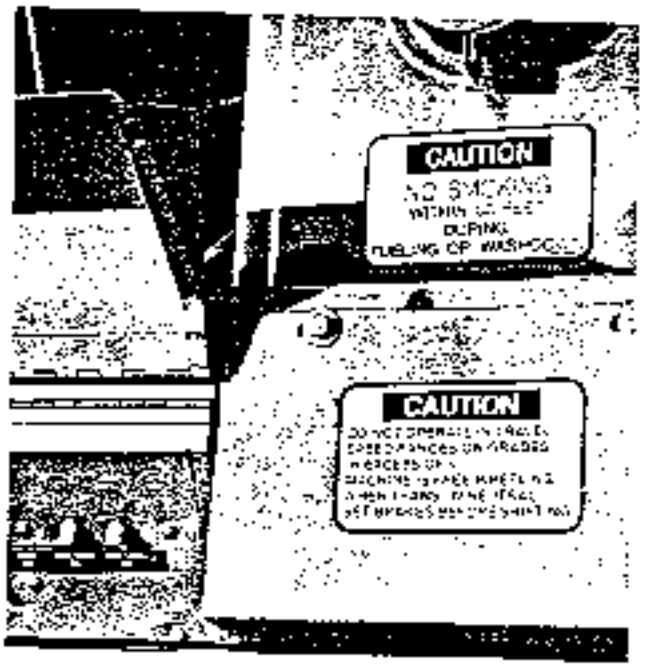
The gears are not designed to permit shifting while the machine is moving. An attempt to do so will put the machine into "neutral," with complete loss of steering control. If this occurs on a grade, the machine could continue to move and the operator would then have to apply the separate brake control to stop the machine.

The braking system, if properly maintained, is effective for stopping the machine, fully loaded, on typical highway grades. However, the brakes may be overlooked by the operator, who customarily controls the speed through the transmission.

To prevent accidents which possibly could result from this situation, it is imperative that the following operating instructions be followed.

1. NEVER shift gears without first bringing the machine to a complete stop and setting the hand brake.
2. NEVER attempt to operate on any grade over 6%, unless the machine is in "PAVE" speed before entering the grade.

Please be sure you understand and adhere to the instructions regarding these procedures, in order to avoid possible accidents.



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CAUTION
DO NOT OPERATE IN TRAVEL SPEED RANGES ON GRADES IN EXCESS OF 6%.
MACHINE IS FREE WHEELING WHEN TRANS. IN NEUTRAL.
SET BRAKES BEFORE SHIFTING.

FIGURE C-3 — Caution Decal Location

1. Make sure all switches are in the OFF position.
2. Set hand brakes.
3. Speed Selector Lever in position "3." (See Caution Note Above)
4. Start engine and idle until hydraulic oil has sufficient time to warm up.
5. Release hand brakes.
6. Raise hoppers for better visibility and to decrease paver width. Use hopper raise-lower switch.

7. Move steering/speed levers to desired speed and direction.
8. To stop, move levers to neutral.
9. To change direction of travel:
   A. Move levers to neutral.
   B. Move levers to new direction.

PAVING PROCEDURE

1. Travel paver to job starting point. (See Section on Travel Procedure.)
2. Lower screed to desired starting position. Use screed lift switch. (Refer to Figure C-2)

NOTE: Refer to Screed Section, E for screed Set-up Procedure.

3. Speed Selector Lever in position "1" or "2" depending on paving speed.
4. If Automatic Grade Controls are to be used they should be set before proceeding to pave. Grade Master switch in set-up position.
5. Set feeders. (Refer to Section E.)
   A. Fill auger area by using feeder switch in "manual".
   B. Before paving begins, switch feeder switches to "AUTO" position. (Refer to Figure C-2)
6. Put screed drive switch in the "on" position. (Refer to Figure C-2)
7. Move speed levers forward until desired paving speed is acquired.
8. To stop the paver, pull levers back to neutral.

FEEDER SPEED CONTROL (Refer to Figure C-4)

The feeder speed control dials control the speed of the feeders. The feeders are at full speed when the dial is turned full clockwise.

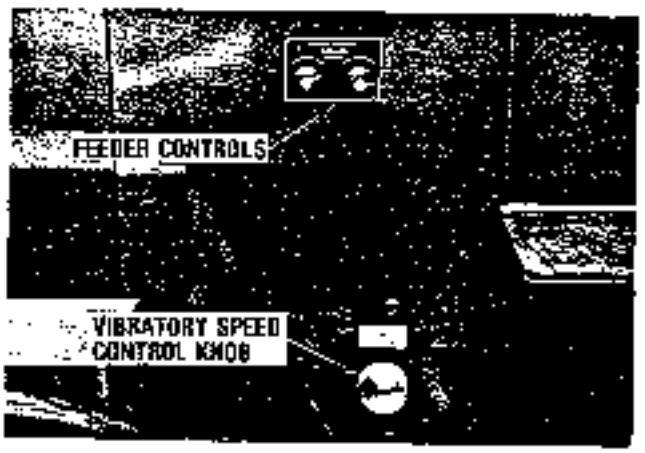

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FIGURE C-4 — Feeder & Vibrator Speed Control

VIBRATORY SPEED CONTROL (Refer to Figure C-4)

The vibratory speed control controls the amount of vibration to the screed.

To Increase Speed — Turn control dial clockwise.

To Decrease Speed — Turn speed control dial counterclockwise.

ACCESSORIES

Accessories are located on the instrument panel. (Refer to Figure C-1.)

1. Engine water temp. gauge.
2. Engine tach-hour meter.
3. Hydraulic oil temp. gauge.
4. Engine amp. meter.
5. Engine oil pressure gauge.
6. Automatic Grade Control on/off switch.
7. Engine start switch.
8. Circuit breakers.
9. Filter condition gauge.
10. Oil level light.

AUTO LEVEL SWITCH (Refer to Figure C-1)

Located on the engine instrument panel. This switch controls power to the Grade Control System. Pilot light indicates when power is ON.

On Position — Grade Controls operate leveling cylinders.

Off Position — Grade Controls are isolated from paver.

Set-up Position — Prevents lockout of hydraulics with speed levers in neutral. For Grade Control Set-up.

FILTER CONDITION GAUGE (Refer to Figure C-1)

Located on the engine instrument panel, the return filter bypasses at 35 PSI. If gauge holds at 15 PSI. after hydraulic oil has warmed up, replace filter.

OIL LEVEL LIGHT (Refer to Figure C-1)

Located on engine instrument panel. Indicates when oil level in hydraulic tank is low.

NOTE: Drain water from hydraulic tank weekly.

INDEX

USE OF MACHINE

PREPARING MACHINE FOR USE

A. The first step before starting the laying operation is to decide what width mat to lay, and to prepare the machine with the proper extensions, cut-off shoes etc., attachments as required. (Refer to Section F) for application and installation.

The standard Finisher, with the use of cut-off shoes, can be set up to lay pavement widths from 8 feet to 10 feet in 3 inch increments.

By adding extension, (Refer to Extensions, Section F), single or in pairs, and with the use of cut-off shoes, the laying width can be increased from 10 feet to 28 feet in 1 inch increments.

From these possibilities, knowing the net width of the pavement to be laid, figure out equal width strips.

The following points must be kept in mind:

1. Allow at least 4" clearance between the outside of the screed and a straight curb for steering. Otherwise the Finisher may become locked against the curb, necessitating backing up and marking the finished surface.
2. When laying multiple strips, subtract the overlaps (approximately 2") at each matched joint.
3. On pavements where multiple strips are required, the cut-off strip should be laid prior to the final strip. Then on the last strip the machine can be used standard for whatever width it is set up for.
4. The cut-off shoe, when used, should be opposite the matching side.

The selection of screed widths, for laying various width pavements, will depend upon a number of factors. The operator will vary them as he becomes familiar with actual operations.

Depending on the specific operation, the following points should be considered:

1. Do not overlap excessively at either end of the screed or improper compaction, bridging and tearing may result. Overlap should be held to a minimum at all times.
2. On wide streets it is sometimes desirable to lay middle strip first to be sure crown is straight and in the center of the street.
3. On streets with curbs and gutters, the screed can overhang the gutter on the top course. On the binder course, the gutter flange should be treated as a straight curb. It is often better to lay full width strips even if there is some hand spreading required at the curbs, in comparison to laying narrow width strips that come out exactly right.
4. In highway paving, of narrow roads, there may not be clearance on the shoulder to overhang the screed on the cut-off side. Either make first strip narrow width, or when desirable to maintain crown break in center of road, match with cut-off shoe riding previously laid mat.

B. Set Automatic Feeder Control Switches to desired setting. (Refer to Feeders, Section E.)

C. Set Screed to desired crown. (Refer to Setting Crown, Section F)

D. Install Automatic Grade and Slope Controls if required.

PUTTING MACHINE TO WORK

A. ALIGN MACHINE.

1. Drive machine into position to start laying. Adjust the steering guide to line up with edge of the roadway, grade line or whatever line has been established for the edge of the mat. (Refer to Figure D-1).
2. If the cut-off plates are to be used for the first strip, align machines so that they are on the inside to provide a better finished outside edge.

B. SET THICKNESS.

1. Place two wood blocks, of approximately 20 to 25% greater thickness than the compacted mat required, under the screed near each end and lower the screed so that its entire weight rests on the blocks. (Refer to Figure D-2). For example, if the mat is to be laid 2" thick compacted, the blocks should be about 2-3/8" thick and approximately 2' long, placed lengthwise in the direction of travel.
   The blocks are required thicker than the finished compacted mat to allow for additional compaction by rollers in back of the Finisher.
2. Turn thickness controls (Figure D-3) to the null or "stack" position.
3. Turn thickness control screws so that the front edge of the screed, is about 1/16" above the top of the wood blocks. This is approximately 1-1/4 turn from the level or "neutral" position. (Refer to Figure D-3).
   As the screeds slides off the blocks it will move on to

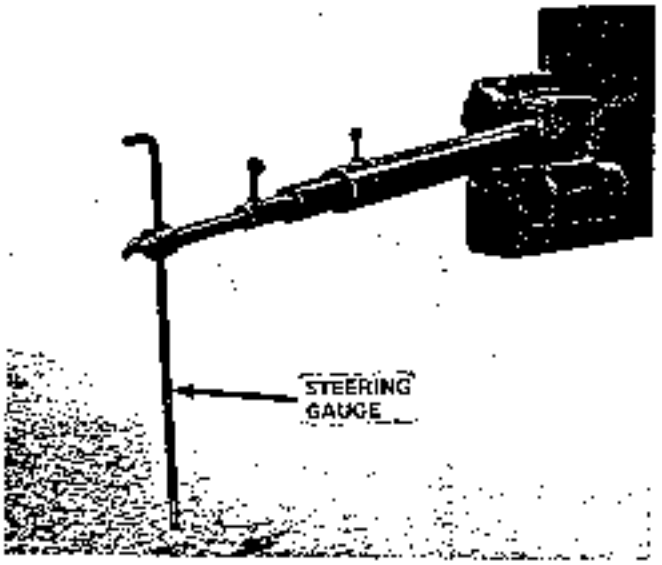

FIGURE D-1 – Steering Gauge

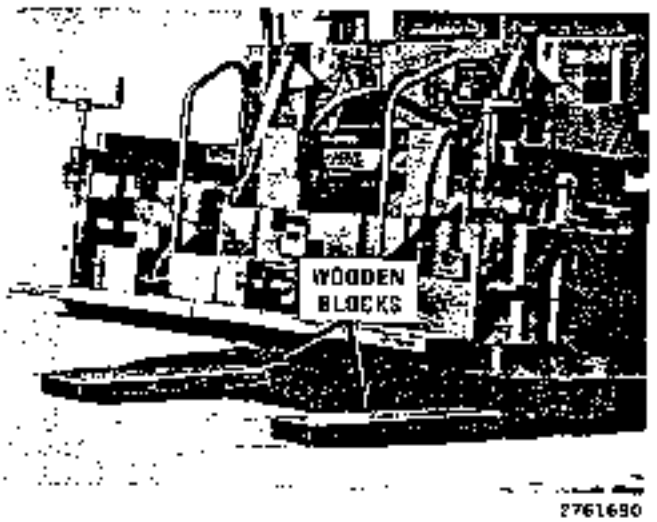

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FIGURE D-2 – Starting Laying Operation

partly compacted material of the same depth as the block thickness.

It is sometimes necessary to begin a mat at near zero thickness and gradually build up to specified thickness, as in patch work. To do this, adjust controls as mentioned above, while the screed is resting on blocks. Then raise screed and replace the blocks with thin strips (approx. 1/4" thick) to prevent scratching the screed surface on abeasive pavement or base surface. Lower the screed and begin paving.

C. DUMPING TRUCK

1. To start operation, the hopper gates should be set at about 1/3 open
2. With feeders and screws operating, have truck back up to Finisher so that rear wheels engage the rollers on the front of the Finisher. (During paving operation, care should be taken to prevent the truck from bumping the machine when it is standing still as this will mark mat surface).
3. The truck brake should be set slightly as it starts to dump the load so that it will not roll away from the Finisher. Control of the truck dumping should be such that none of the mix will spill out in front of the machine.
4. When the material has been carried back into the feeder tunnel and has been discharged and spread uniformly ahead of the screed turn off feeder switches.
5. Set automatic feeder control paddles and adjust material feed. (Refer to Feeder Controls, Section E). Final adjustment of the automatic feeder control paddles is made after the machine has started paving and is moving along at a uniform rate of speed. After the automatic feeder control paddles have been set and material has been spread uniformly ahead of the screed, to a depth just above the center of the spreading screws, the paving operation can be started.

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FIGURE D-3 – Thickness Control

START PAVING OPERATION

1. Transmission Lever in position 1 or 2 depending on paving speed desired.
2. Screed Drive switch in "On" position.
3. Engine at full operating speed
4. Left-Right Feeder switches in "Man" position
5. Fill screw chamber with material.
6. Left Right Feeder switches in "Auto" position.
7. Move Speed Levers forward to desired paving speed.
8. Screed man adjust vibrator speed.
9. Check material level in the screws.

The hopper gates should be regulated so there will be an almost constant flow of material coming to the screws. (Refer to Head of Material, Section F).

11. Check adjustment of Automatic Feeder Control Paddles. The adjustable gates are for the purpose of regulating the capacity of the feeders and controlling the material feed in relation to, and in conjunction with, the Automatic Feeder Control Paddles and Feeder Speed. (Refer to Feeder Controls, Section E)
12. Screed man check thickness.
At this stage the screed operator should carefully check the depth of material laid at each side of the mat and adjust the thickness controls so that the proper depth is obtained. (Refer to Thickness Control, Section F).

NOTE This check should be made at several points across the width of mat before changing adjustment of thickness controls. The tool may contact a depression or high spot, giving an inaccurate indication of mat thickness.

13. Joint matching. (Refer to Matching Joints, Section F).

ENDING A STRIP

In order to make a good transverse joint one must know the proper method for ending a strip.

It is generally agreed that when ending a strip, a square, vertical edge should be left to accomplish a good bond in the transverse joint.

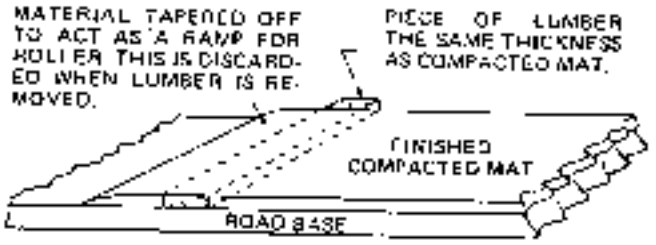

FIGURE D-4 – Ending a Strip

There are several methods used to square off and end a strip to insure a good transverse joint

1. One method commonly used is to place a piece of lumber, the same thickness as the compacted mat, in the mat just before the end of the strip. (Refer to Figure D-4)
Toward the end of any strip, the operator should run the feeders and screws so that the material is spread evenly across the front of the screed. Then stop the feeders and operate the machine forward. As soon as any part of the leading edge of the screed becomes exposed, stop the machine and raise the screed. An opening is then raked square across the mats and the piece of lumber is placed in this opening. Material is then pushed against the board to hold it firmly in place. After the mat has been rolled and set up, the board may be removed. This leaves a square, vertical edge to insure a good transverse joint when the next strip is joined to it.
2. Another method commonly used for ending a strip or to get the roller on the mat at the beginning of a strip, is to square up and rake an opening, then firm the end and lay rosin paper in the opening. The rosin paper is then covered with material formed into a ramp for the roller.
3. A rope can be laid down near the end of a strip and the Finisher lays the mat over it. When the mat is rolled, a mark is left across the mat over the rope. The material, at the extreme end of the mat, opposite the rope mark is cleared away and the end formed by hand.

TRANSVERSE JOINT (Uncompacted Mat)

If the machine is going to be brought back to make a joint before the asphalt has cooled appreciably, keep the roller off the last two yards of the strip.

Then when making the joint, back the raised screed over the mat until three or four inches of the mat can be seen in front of the screed. Lower the screed upon the mat, fill up the screws with material and proceed with normal paving.

Be sure the thickness controls are in the same position that they were before ending the joint. If that position has been changed, adjust the thickness controls with the screed resting on the mat.

TRANSVERSE JOINT (Compacted Mat)

If the transverse joint is to match a compacted mat, start off the machine as above, only be sure to allow additional mat thickness for roller compaction.

SPRAY CLEANING (Refer to Figure D-5)

The spray cleaner is used when cleaning the machine before and after operation.

The following areas should be thoroughly cleaned of all dead and hardened material that could cause binding, excessive wear and dragging in the mat being laid.

1. The entire hopper area.
2. Push roller assembly.
3. Flight chains and guards - while flights are running.
4. Raise foot shaft covers and clean loose material from frame, then spray shafts and rollers while flights are running.
5. Back of tractor, center screw drive, housing, head shafts and sprockets - spray while flights are running.
6. Front of screed.
7. Clean, spray and check bottom of screed.
8. Spray roller chains with diesel fuel, periodically.

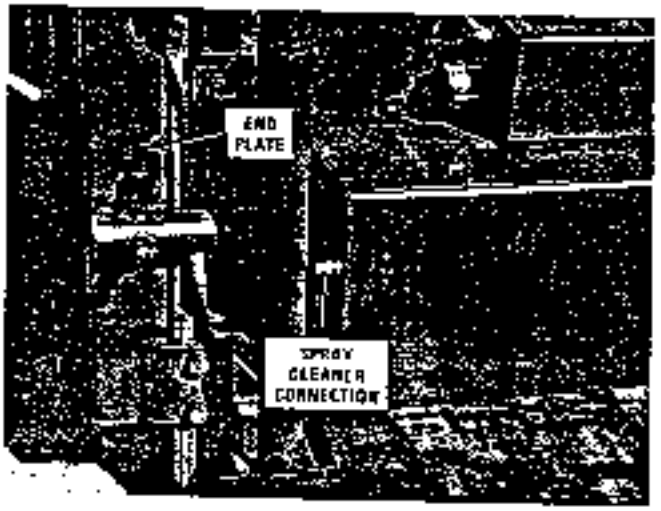

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FIGURE D-5 – Spray Cleaning

MAT PROBLEMS

Regardless of the type of problems involved, the following approach should be used in the troubleshooting of mat problems.

1. Observe - A visual observation of problem.
2. Analyze - With the knowledge of operation procedures, formulate possible cause.
3. Isolate - Through use of following chart and its sequence for checking.
4. Remedy - The necessary instructions, adjustments, repair or replacement is performed.
5. Report - A written record of problem for reference.

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
POOR COMPACTION	1. Vibratory running to slow.	. Increase vibrating drive speed.
TEARING FULL WIDTH OF MAT	1. Speed to fast. 2. Temperature varying in mix. 3. Screed plates worn out. 4. Cold screed 5. Mat thinner than largest aggregate. 6. Material too cold. 7. Excessive moisture in mix. 8. Pre-strike off not adjusted properly 9. Vibrator running to slow	. . Cut down paving speed . . Correct problem with trucks or at plant. . . Replace. . . Heat screed. . . Increase thickness. . . Correct problem at plant. . . Correct problem at plant. . . Adjust pre-strike off. . . Increase vibrating drive speed.
STREAK DOWN CENTER OF MAT	1. Not enough lead crown. 2. Feeder gates closed down too far 3. Feeder screws worn out.	. . Adjust lead crown (Refer to Section F). . . Raise feeder gates. . . Replace.
MAT TEARING ON EDGES	1. End plate not square. 2. Cold material building up at end of feeder screws. 3. Extensions installed incorrectly. 4. Feeder gate closed down too far.	. . Adjust. . . Clean off material build-up. . . Check installation. . . Open gates.
SCREED RAISES EACH TIME MACHINE STARTS FORWARD	1. Feeder screws loaded too heavy. 2. Sensor mounting. 3. Feeder screws worn out. 4. Sitting long periods between loads. 5. Temperature varying in mix.	. . Check feeder control paddles. . . Refer to Auto Grade Control, O.S.M. . . Replace. . . Correct problem at plant or with trucks. Slow down paving speed. . . Correct problem at plant

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
FEEDER SCREW SHADOWS	1. Feeder screws loaded too heavy. 2. Feeder screws worn out. 3. Segregation in mix.	. Check feeder control paddles. . Replace . . Correct problem at plant.
BRIGHT STREAK DOWN CENTER	1. Too much lead crown. 2. Feeder screws worn out. 3. Feeder gates open too far.	. Adjust lead crown (Refer to Screed Section F) . Replace. . Lower gates.
UNABLE TO CONTROL SCREED	1. Cold screed. 2. Mat thinner than largest aggregate. 3. Screed pivot loose. 4. Unstable mix.	. . Heat screed. . . Increase thickness. . Tighten at leveling arm connection . Correct problem at plant.
SCREED MARKS	1. Trucks bumping Finisher 2. Sitting long periods between loads. 3. Pre-strike off not adjusted properly.	. . Instruct drivers. . . Correct problem at plant or with trucks. Slow down paving speed. . . Adjust pre-strike off.
FLUCTUATING MAT	1. Temperature varying in mix. 2. Head of material fluctuating. 3. Sitting long periods between loads. 4. Vibratory running to slow. 5. Mat thinner than largest aggregate. 6. Extensions installed incorrectly. 7. Screed plate worn out. 8. Running hopper empty between loads. 9. Trucks holding brakes 10. Feeder screws worn out. 11. Cold screed. 12. Material to cold 13. Segregation in mix. 14. Pre-strike off not adjusted properly.	. . Correct problem at plant or trucks. . . Adjust feeder control paddles. . . Correct problem at plant or with trucks. Slow down paving speed . Increase vibrating drive speed. . Increase mat thickness. . Check installation. Replace . . Do not run feeders empty. Instruct drivers . . Replace screws. . . Heat screed. . . Correct problem at plant. . . Correct problem at plant. . . Adjust pre-strike off
RIPPLES	1. Head of material fluctuating. 2. Feeder screws loaded too heavy. 3. Auto grade control hunting. 4. Speed to fast. 5. Screed plates worn out. 6. Roller in poor mech. condition. 7. Feeder screws worn out. 8. Unstable mix. 9. Too much crown.	. . Adjust feeder control paddles. . . Check feeder control paddles. Lower feeder gates. . . Adjust sensitivity. . . Cut down paving speed. . . Replace screed plates. . Repair roller. . . Replace feeder screws. . . Check problem at plant. . . Adjust lead crown. (Refer to Section F).

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
RIPPLES (con't)	10. Not enough lead crown.	. . Adjust lead crown. (Refer to Section F)
	11. Trucks holding brakes.	. . Instruct drivers
	12. Temperature varying in mix.	. . Correct problem at plant.
	13. Pre-strike off not adjusted properly.	. . Adjust pre-strike off.
	14. Too much play in thickness control.	. Adjust thickness control.
RICH OR FAT SPOTS (BLEEDING)	1. Excessive moisture in mix.	. . Correct problem at plant.
	2. Poor rolling operation.	. . Instruct roller operator.
	3. Pre-strike off not adjusted properly.	Adjust pre-strike off
	4. Vibratory running to fast.	. . Cut vibrating drive speed.
POOR SURFACE TEXTURE	1. Head of material fluctuating.	. . Adjust feeder paddles.
	2. Feeder screws loaded too heavy.	. . Check feeder control paddles. Lower feeder gates.
	3. Extensions installed incorrectly.	. . Check installation.
	3. Extensions installed incorrectly.	. . Instruct drivers
	4. Trucks holding brakes.	. . Correct problem at plant.
	5. Material too cold.	. . Correct problem at plant.
	6. Excessive moisture in mix.	. Cut paving speed.
	7. Speed to fast.	. Correct problem at plant
	8. Temperature varying in mix.	. . Replace screed plates.
	9. Screed plates worn out	
WAVY SURFACE (LONG)	1. Running hopper empty between loads.	. . Cut paving speed. Do not run feeders empty.
	2. Head of material fluctuating	. . Adjust feeder control paddles.
	3 Feeders loaded too heavy.	. . Adjust feeder control paddles. Lower Feeder Gates.
	4. Temperature varying in mix.	. . Correct problem at plant.
	5. Overcorrecting thickness controls.	. . Instruct screed operator.
	6. Poor grade reference.	Improve reference.
	7. Feeder screws worn out	. . Replace feeder screws.
	8. Feeder gates open too high.	. . Lower feeder gates.
	9. Segregation in mix.	. . Correct problem at plant.
	10. Sitting long periods between loads.	. . Correct problem at plant or with trucks. Slow down paving speed.
WAVY SURFACE (SHORT)	1. Auto grade control hunting.	. Adjust sensitivity.
	2. Head of material fluctuating.	. . Adjust feeder control paddles.
	3. Feeder screws loaded too heavy.	. Lower feeder gates.
	4. Overcorrecting thickness control screws.	. . Instruct screed operator.
	5. Segregation in mix	. . Correct problem at plant.
	6. Feeder screws worn out.	. . Replace feeder screws.
	7. Roller in poor mechical condition.	. . Repair roller.

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
POOR LONGITUDINAL JOINT	1. Not rolling joint soon enough 2. Overcorrecting thickness control screws. 3. Feeder screws loaded too heavy. 4. End plate not square 5. Head of material fluctuating. 6. Excessive overlap. 7. Grade sensor out of adjustment.	. . Instruct roller operator. . . Instruct screed operator. . . Lower feeder gates. Adjust end plate Check auto feeder control paddles. . . Overlap more than 2" . Adjust sensitivity.
POOR TRANSVERSE JOINT	1. Nulling out screed done incorrectly. 2. Overcorrecting thickness control screws. 3. Poor rolling operation. 4. No allowance for roller compaction. 5. Feeder screws loaded too heavy. 6. Temperature varying in mix. 7. Cold screed. 8. Not rolling joint soon enough. 9. Material too cold. 10. Joint not prepared correctly.	. Re-null. . Instruct screed operator. . . Instruct roller operator. . . Allow for roller compaction . Check feeder control paddles . . Correct problem at plant. . . Heat screed. . . Instruct roller operator. . . Correct problem at plant. . . Read joint matching, Section F.
TRANSVERSE HAIRLINE CRACKS	1. Poor rolling operation 2. Feeder screws loaded too heavy. 3. Excessive moisture in mix 4. Head of material fluctuating. 5. Speed too fast. 6. Unstable mix. 7. Pre-strike off not adjusted properly	. . Instruct roller operator. . . Check feeder control paddles. . . Correct problem at plant. . Check feeder control paddles . Slow down paving speed. . Install pre-strike off. . . Adjust pre strike off
TEARING OUTSIDE (BEFORE ROLLING)	1. Too much lead crown. 2. Cold screed. 3. Feeder gates open too high. 4. Paving thinner than largest aggregate. 5. Extensions installed incorrectly 6. Cold material building up at end of feeder screws. 7. Pre-strike off not adjusted properly.	Adjust lead crown (Refer to Section F). . . Heat screed. . . Lower feeder gates. . Increase thickness . . Check installation. . . Remove material build-up. . . Adjust pre-strike off.

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FEEDER CONTROLS

SET AUTOMATIC FEEDER CONTROL PADDLES AND ADJUST MATERIAL FEED

1. Position and set the automatic feeder control paddles, Figure E-1, at the minimum position where they will actuate the switches to feed more material. The paddles should be turned at a slight angle to the spreading screw. As the material is moved across the screws, it raises the paddles, shutting off the automatic switches, stopping the feeders and screws.
   This adjustment is with paddle tip hanging just above bottom of screw conveyor and the switch positioned just outboard of the end of the screw conveyor that is engaged. The actuator on the switch is adjusted so it actuates the switch when paddle is raised to top of screw conveyor shaft or is at approximately 45° angle from straight down.

NOTE: With paddle arm in vertical position, and feeder speed control cables full in, Figure E-2, the feeder bars should run at maximum speed approximately 97 flight bars per minute at hopper.

2. Final adjustment of the automatic feeder control paddles and feeder speed is made after the machine has started paving and is moving along at a uniform rate of speed.
   The feeder speed should be adjusted so the feeders are operating 80% or 6 to 8 times per minute.

NOTE: When a screw extension is used, the paddle should be moved outward to ensure the proper amount of material is conveyed to the extension.

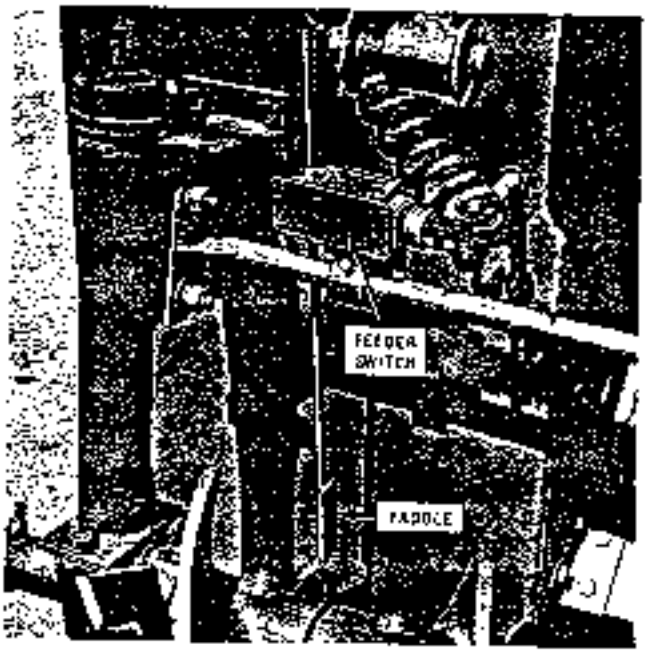

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FIGURE E-1 – Automatic Feeder Control Paddle

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FIGURE E-2 – Feeder Speed Control

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
Feeder Will Not Operate in Automatic With Paddle Arm in Any Position	A. Defective Wiring or Switches	1. Activate manual feeder switch.
	B. Defective Feeder Control Switch	1. Interchange suspected defective unit with unit from other side of machine. Replace defective feeder unit.
Feeders Will Not Shut Off or Are Intermittant	A. Incorrect Alignment or Location of Feeder Control Switch	1. Follow set-up procedure for feeder system.
	B. Defective Feeder Control Switch	1. Check electrical wiring.

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SCREED

SCREED

The SA-145 Finisher uses the self leveling screed principle to obtain a smooth riding and level mat, free of any sharp depressions that cause a rough riding surface. It has the ability to fill in the low spots and scratch over the high spots to level out rough roads. The screed is free to float up and down independent of the tractor and only uses the tractor to tow it along and to meter material to it as is needed. Two leveling arms, one on each side of the tractor, are used to tow the screed behind the tractor. Where the leveling arms attach to the tractor is referred to as the tow point. The rearward ends of the leveling arms are attached to the screed. This is called the pivot because it allows the screed man to manually change the angle of the screed by means of the thickness control screws. This is called the angle of attack.

vary the forward motion without compensating for the other forces will change the mat thickness. For example, paving a mat two inches thick at 25 F.P.M. Now if the paving speed is increased to 50 F.P.M., covering twice the distance, twice the amount of material should be used. But at this speed, the material cannot pass under the screed, so to compensate for this, the angle of attack will have to be increased accordingly, to permit more material to pass under the screed to maintain the two inch mat thickness. A momentary change in the speed of the finisher, such as trucks holding their brake then releasing it, will change the mat texture and thickness. This could happen in the manual mode of operation, but in the automatic mode of operation, the automatic speed control system would compensate for the change automatically. (Refer to Section F-2, Speed Control System).

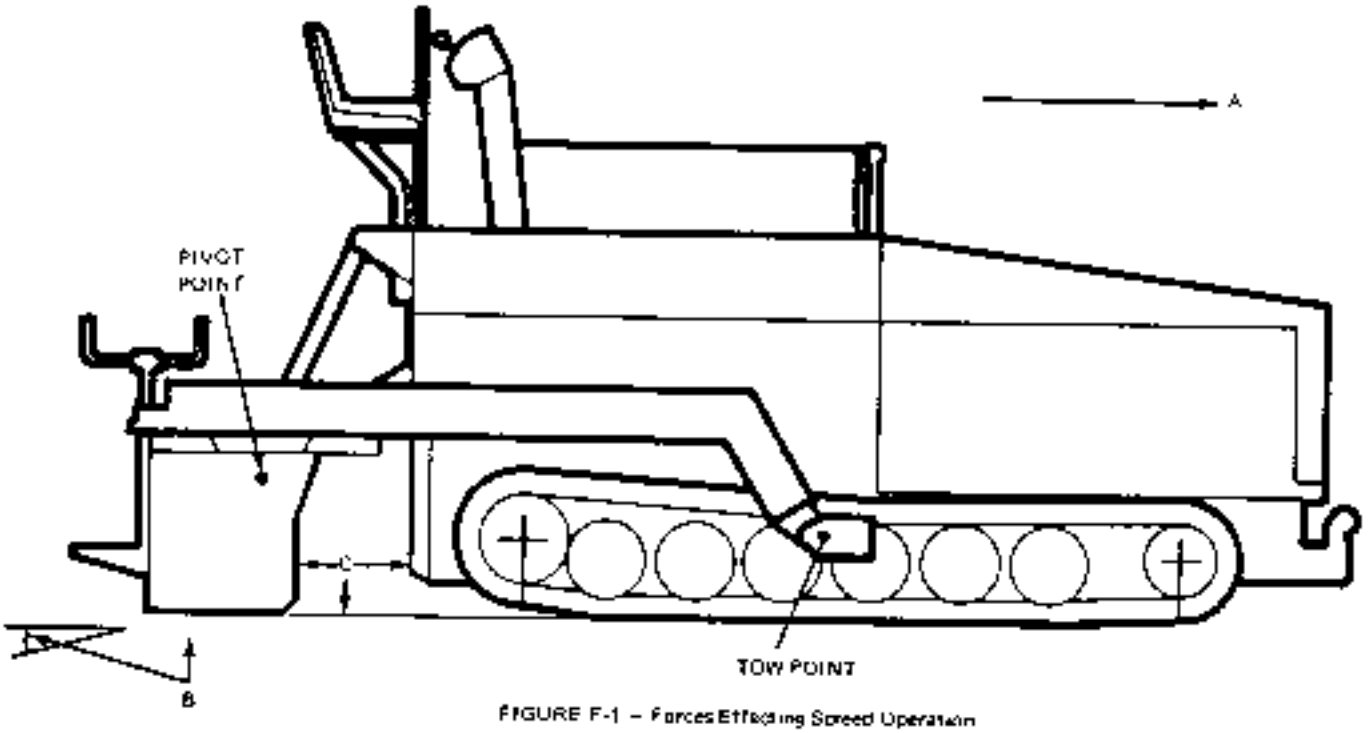

FIGURE F-1 – Forces Effecting Screed Operation

Three forces that effect mat thickness are:

A. Forward Speed
B. Angle of Attack
C. Head of Material

If any one of these forces vary, it will effect the mat thickness or mat quality and texture.

A. FORWARD SPEED (Refer to Figure F-1)

Forward motion naturally is required to move the screed forward, which forces the material under the screed. To

B. ANGLE OF ATTACK (Refer to Figure F-1)

The angle of attack is introduced into the screed by the use of the thickness control screws. The more angle that is induced the thicker the mat will be. The less angle induced the thinner the mat. This is the same principle of a water skier. The force of the inclined skis against the water will lift him up and keep him up as long as speed and angle of skis remain constant. So to obtain the best riding surface, the thickness control screws should never be changed once correct mat depth is reached. (Except to buy back cylinder

when tow point cylinder either tops out or bottoms out when using Automatic Grade Control.)

When paving connection courses over old pavements and the depths vary from point to point, the thickness control screws should be left alone or a rough pavement will result. The self leveling screed has the ability to shave the high spots and fill in the low spots. To try to maintain the same thickness would leave no better riding surface than the road being surfaced.

C. HEAD OF MATERIAL (Refer to Figure F-1)

The head of material is the amount or mass of mix that is metered and pushed ahead of the screed.

Of all the forces the most important and the most difficult to control is the head of material. The mass of material ahead of the screed is exerting pressure in four directions (Refer to Figure F-1) The head of material should remain constant in order to obtain a good bump free riding surface.

The factors that control the head of material are the proper adjustment of the flow gates and the automatic feeder pots, in conjunction with the depth, width and paving speed.

THE FINISHER AS A UNIT

In order to understand the principle of the Barber-Greene self leveling Finisher, it is necessary to have a clear picture of the flow of material through the machine and general sequence of operation (Refer to Figure F-2)

LEVELING

A brief explanation of the principle of leveling will aid in understanding the operation of the Finisher

To illustrate and explain the principle of leveling a series of small drawings are used.

The tractor unit travels on road base and pulls the screed. Figure F-2. In operation we will assume the base is level and see how the screed controls the thickness of mat laid.

The basic principle of the Finisher is: The screed when pulled into the material will automatically ride up or down to seek the level where the bottom (AB) Figure F-3 or the road surface becomes parallel to the direction of the pull (CD) and continues parallel, laying a definite thickness until the screed alignment is changed.

FIGURE F-3

By changing the thickness control (W), the relationship between the screed and leveling arm, the screed is tilted and rides to a new level.

FIGURE F-4

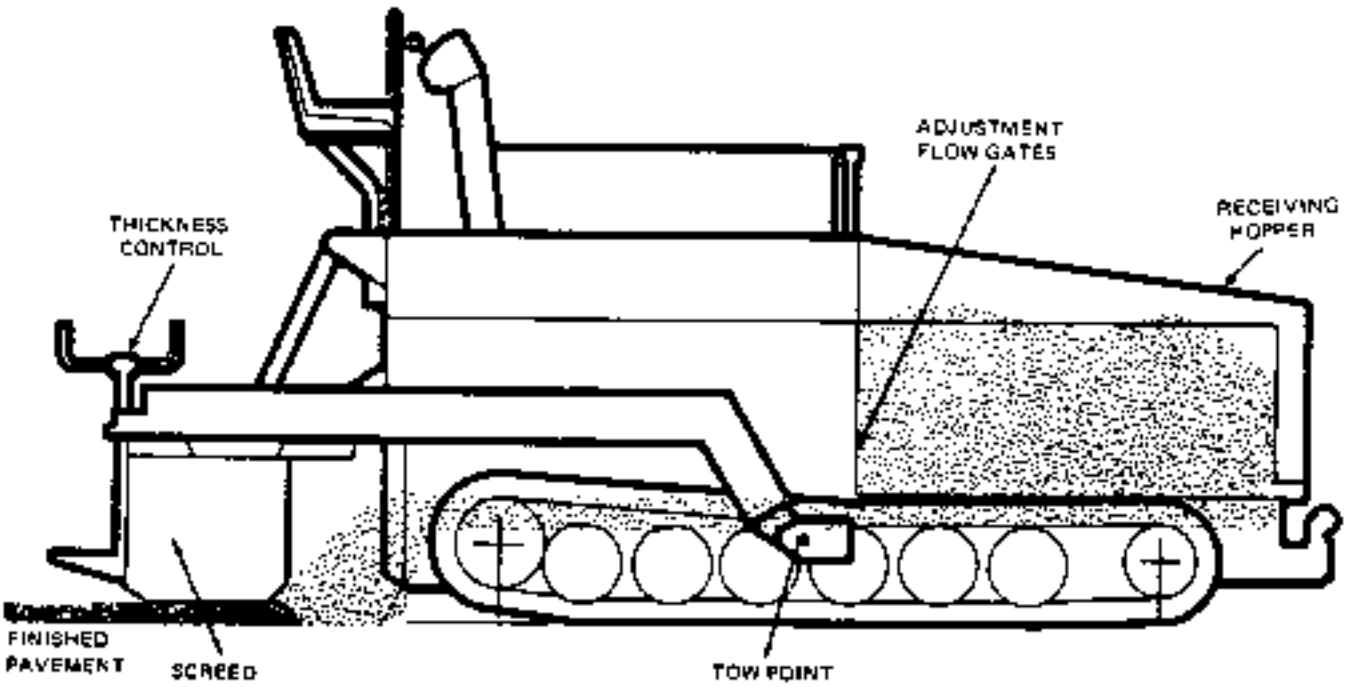

FIGURE F-2 – Flow of Material

For example. To increase thickness, the screed is tilted up and gradually rides up to a higher level, Figure F-4, until line (AB) again becomes parallel to direction of pull (CD), Figure F-5.

NOTE: The sketches shown here Figs. F-3 through F-16 must necessarily be exaggerated. Actually the initial tilt of the screed is relatively so small it cannot be observed in the finished pavement.

FIGURE F-5

FIGURE F-6

To decrease thickness, the screed is tilted down, Figure F-6, and it will gradually travel to a lower level until (AB) again becomes parallel to (CD) Figure F-7.

Changing the level gradually, or over considerable distance, prevents sudden adjustment or steps that destroy the smooth riding surface. This is a very important foolproof feature. The importance of this characteristic will be seen as we see how it produces a smooth surface when the base is uneven.

FIGURE F-7

FIGURE F-8

Assume the screed is adjusted for a given thickness of mat, and the crawlers travel up to a higher level on the base, Figure F-9.

FIGURE F-9

The screed plate bottom (AB) is automatically tilted up, Figure F-10.

FIGURE F-10

The screed will then travel up to where line (AB) is parallel to (CD), Figure F-10.

When the finisher encounters a depression, the reverse action takes place, as the crawlers travel into the depression or to a lower level, the screed tilts down, Figure F-11.

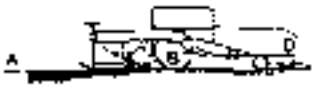

FIGURE F-11

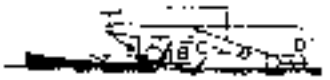

FIGURE F-12

The screed will then travel down to a lower level where (AB) is again parallel to (CD), Figure F-12.

The Barber-Greene leveling feature depends upon time, or distance, instead of mechanical ratio. The crawlers may change level, but it takes time before the screed has climbed to the new level. The crawlers may be up and over the short bump, holes, manholes, etc., before the screed has had time to noticeably react, thereby leaving a level surface behind. Thus a mat is laid and compacted on an irregular base with bumps and depressions automatically filled in, producing a smoother riding surface.

The most important thing to remember when adjusting thickness control is not to move the control more than two notches at a time. If the control is moved too much without giving the machine time to act, the result is over adjustment with a resultant over-correction in the road surface.

CONTROL OF SCREED

Now let us look at the area of the screed unit and note how each side can be controlled independently.

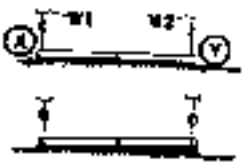

FIGURE F-13

If the corner (Y), Figure F-13, of the screed is raised by control (W2) producing a slight warping in the whole screed surface, this will gradually come up and level out to the new setting, and the finished mat is thicker on one side as shown.

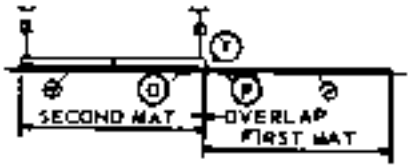

FIGURE F-14

MATCHING JOINT

To match mat (N), already laid, the edge of screed (Y) is kept practically flush with surface (N) preferably overlapping it an inch or two. When the joint is compacted, the two mats are properly bound together.

In operation, the level of screed at (Y) follows the surface level of mat (N) because the crawler (O) that controls this end runs close to where crawler (P) previously ran.

SETTING CROWN

To provide a specification crown, the center of the screed is adjusted, as shown, Figure F-15, to whatever amount is required. This can be quickly done without stopping the machine, if so desired.

FIGURE F-15

YIELD

Due to this degree of leveling control, we have occasionally encountered this problem in the field. The contractor is required to lay over an irregular base a mat of a definite minimum thickness. Tonnage has been figured over the entire area at the same thickness as the minimum. When laying a level surface over an irregular base, where the thickness must necessarily be an average, it is physically impossible to hold to a minimum thickness on the high spots and not over-run the tonnage figured on the minimum thickness.

Either the minimum thickness or minimum tonnage must be sacrificed, otherwise the resurfaced area will be no smoother than the base on which it was laid. This is clarified by Figure F-16.

The Finisher is designed to level automatically and when once set for proper thickness and left alone it will produce a much better surface than when manually controlled.

FIGURE F-16

Too much emphasis cannot be placed on the importance of being careful of over adjustment of the thickness controls.

Never turn the thickness control more than two notches at a time, Figure F-17. Allow machine to operate and travel sufficiently (approximately ten feet) before checking results of new setting and making another adjustment.

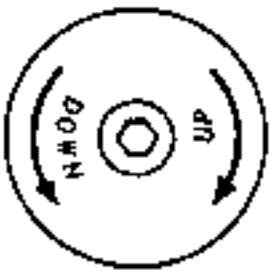

FIGURE F-17 — Thickness Control Instruction Plate

Let the Finisher give a riding surface that will be true under the straight edge and be careful of over adjustment of thickness controls in trying to follow a certain set thickness in the mat. The ideal operation produces a true riding surface and an average thickness of mat.

ADJUSTMENTS

There are five major areas to adjust on the Finisher, to give the best production, quality and life. These five areare:

1. Flow Gates
2. Feeder Control Pots and Spreading Screw
3. Lead Crown
4. Vibratory Screed Drive Speed
5. Paver Speed

CONVEYORS AND SCREWS

These components convey the material from the hopper back to the front of and across the full width of the screed in a uniform manner for placement under the screed. An important adjustment in the correct feeding of material in front of the screed is the Automatic Feeder Control Pots. Refer to Feeder Controls, Section E-1, for proper adjustment.

FLOW GATES

The adjustable flow gates are located at the back of the hopper in front of the tunnel. (Refer to Figure F-18). They regulate the flow or amount of material onto the feeder screws which in turn distributes the material evenly in front of the screed. The flow gates are controlled by adjustment screws, Figure F-18, and should be adjusted to a height which will allow the conveyors and screws to operate 80%, or 6 to 8 times per minute. The ends of the screws should not be filled too full of material.

FIGURE F-19

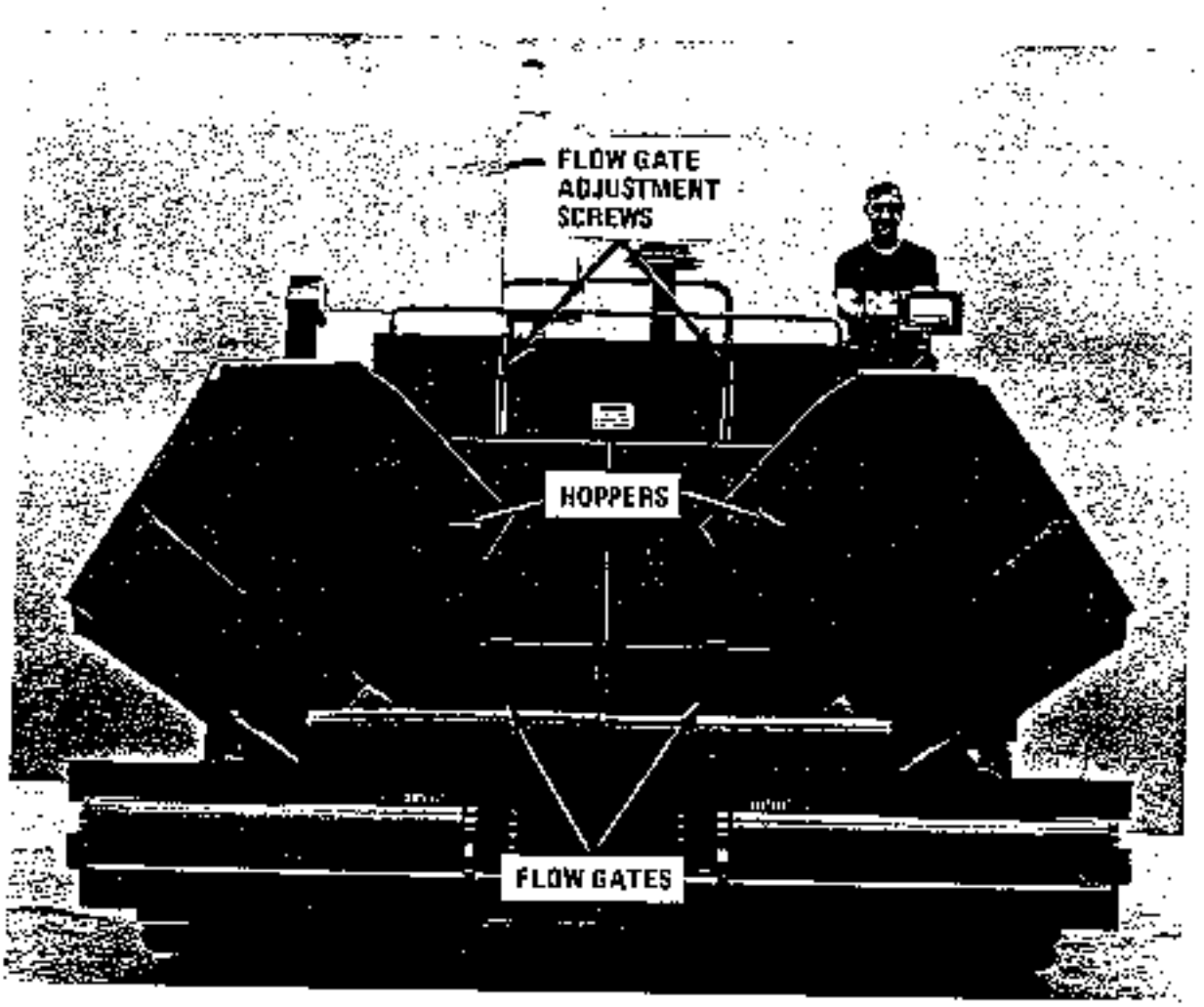

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FIGURE F-18 Flow Adjustment Screws

CROWN CONTROL ADJUSTMENT

The crown control adjusts the screed to produce the desired contour of the finished pavement. (Refer to Figure F-19).

For normal adjustment of the screed the procedure is as follows. (Refer to Figure F-20.)

1. With thickness controls set at neutral position, break chain (A) on the crown adjustment sprockets.
2. Then with a tight string or straight edge on both the leading and trailing edge of the screed, turn adjusting nuts on both screws (B) and (C) until both the leading and trailing edges of the screed are in a straight line with the straight edge.
3. Then put 1/16" to 3/16" crown on the leading edge of the screen only.
4. Replace chain (A) on crown adjustment sprockets.

On certain types of dense mixes it may be found necessary to adjust the screed so that all parts of the screed will give a uniform ironing action.

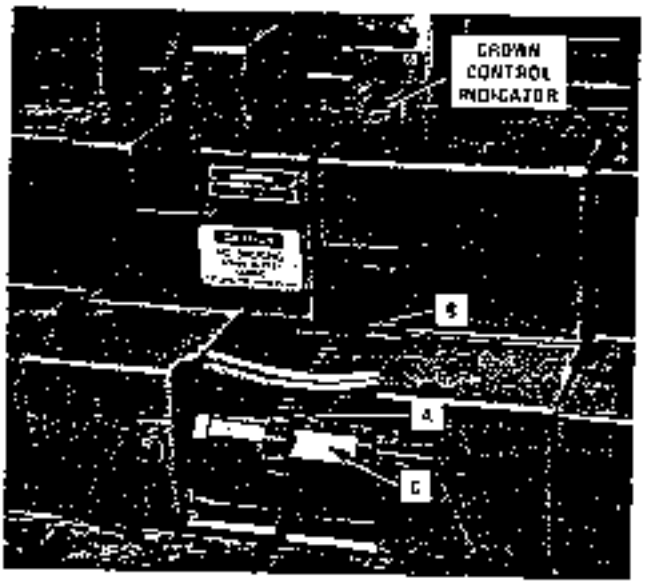

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FIGURE F-20 – Crown Control

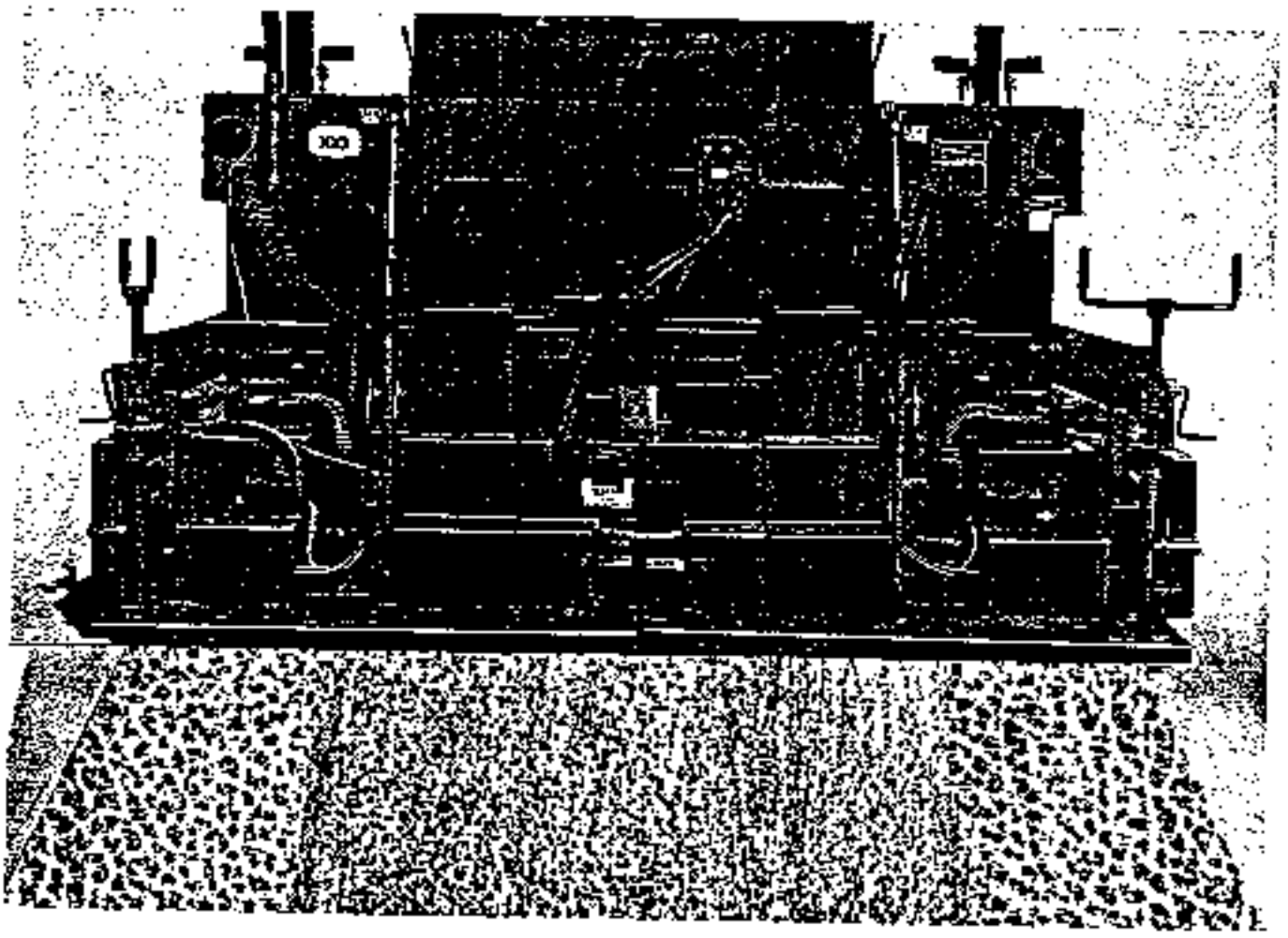

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FIGURE F-21

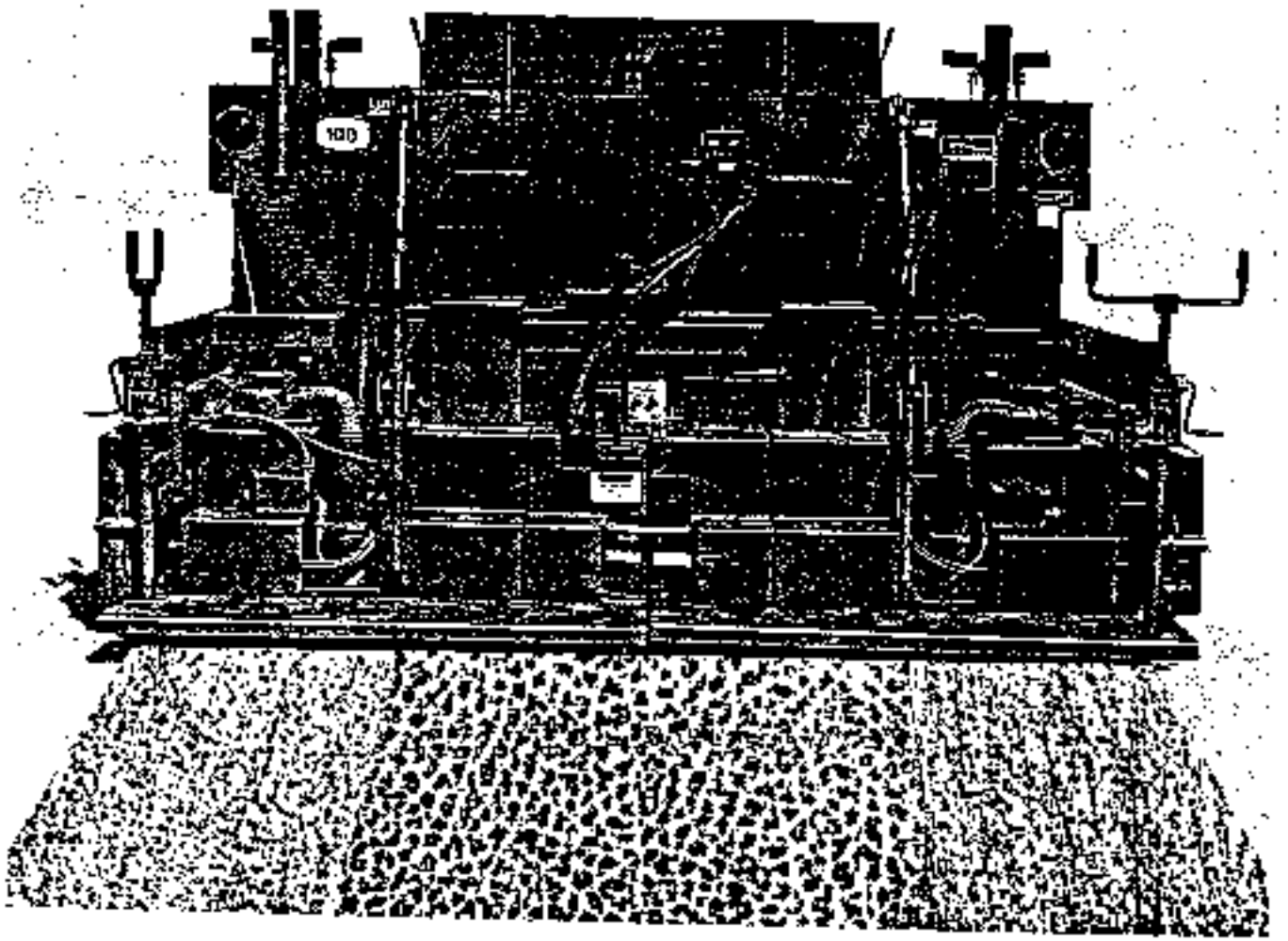


FIGURE F-22 2761679

If there is a consistent tearing on the edges of the mat being laid, it is an indication of a lack of material under the edges of the screed. (Refer to Figure F-21.)

To remedy this condition the procedure is as follows:

TO ADJUST SCREED (Refer to Figure F-20)

1. Break chain (A) Figure F-20, connecting the two sprockets of the crown control.
2. Remove a little of the crown in the leading edge of the screed using only the screw (B). It is best to make this adjustment while the machine is operating so the result can be watched.
3. After adjusting screw (B), replace the chain so that any time the crown has to be changed both the leading and trailing edges of the screed will stay in alignment.

In some cases the center of the mat may show consistent tearing which may indicate a lack of sufficient material under the center of the screed (Refer to Figure 22).

To correct this, additional crown must be added to the leading edge of the screed. It is the reverse of the operation described above.

THICKNESS CONTROL (Refer to Figure F-23)

The thickness controls increase or decrease the depth or thickness of the material being laid.

1. To increase the depth, turn controls to the right or clockwise.
2. To decrease the depth, turn controls to the left or counterclockwise. A lock is provided at the lower end of the thickness control screws, Figure F-23, to secure the position of the controls.
3. The level or neutral position can be "felt" when turning the thickness controls with the screed resting on blocks. The thickness controls will turn very easy with no drag for a 1/2 turn or so when the level position is reached.
4. Dial, Figure F-23, are provided as a guide for the screed operator. When the controls are adjusted for a given depth of material being laid, he will note the positions of the controls. This will guide him in making adjustments up or down when needed, as machine progresses.

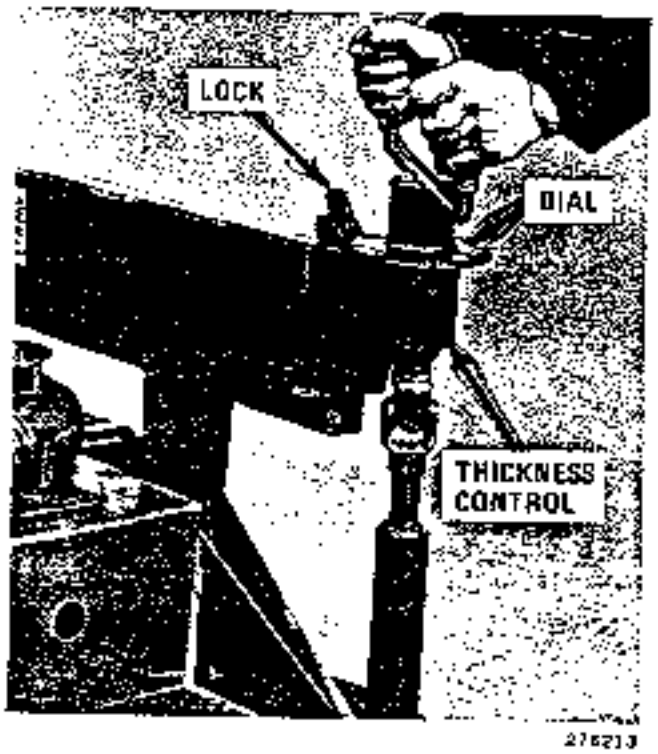


FIGURE F-23 – Thickness Control

A given depth cannot be set with these dials as the position will vary for different materials however, the screed operator will adjust the levers to provide the proper depth and thus determine and note the position of the dial for the material being handled.

PUTTING MACHINE TO WORK (Refer to Section D of Finisher OSM)

On the initial start up when the action of the vibrator screed on a certain material is unknown, set the vibrator speed at 50% RPM by opening the flow control valve on the screed.

Note the texture and compaction of the mat being laid and adjust vibrator speed until the desired mat appearance is obtained.

In those rare instances when it is necessary to change weights to obtain desired mat. (refer to Chart, Page II-2).

TROUBLESOME MIXES

When encountering dense, "critical" mixes, the pre-strike off is needed. Set the strike off about 3/8" above the bottom of the screed plate. Set the vibrator speed at 50%. Make adjustments on the pre strike off and/or vibrator speed until desired mat is obtained.

Removal of the pre-strike off when required only part of the time, is unnecessary. It may remain on the machine while working coarse mixes.

SCREED EXTENSIONS

Six inch, one foot, and two foot extensions are available in kit form, so that the screed can be extended from the standard 10' to the recommended 20' with six inch increments. Additional screw extension and additional vibrator will be used with the two foot extension only. The extensions can be installed by starting with the screed plate and working up as shown in the following illustrations.

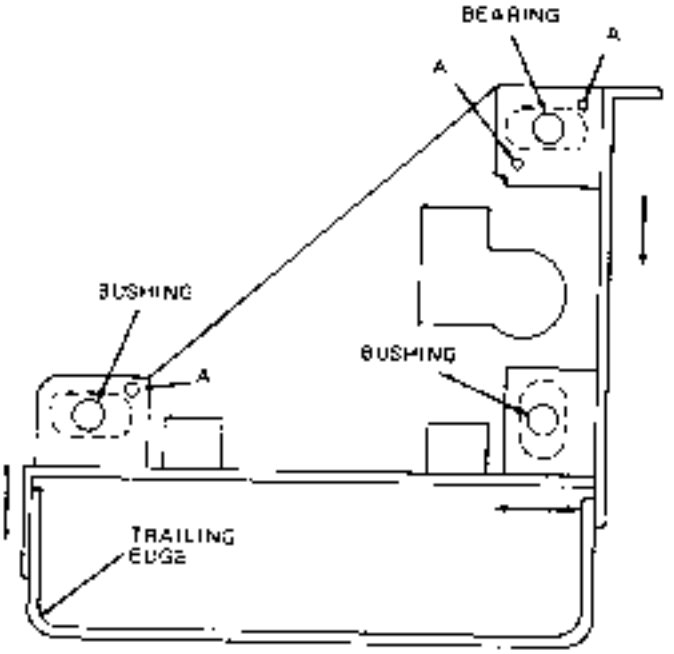
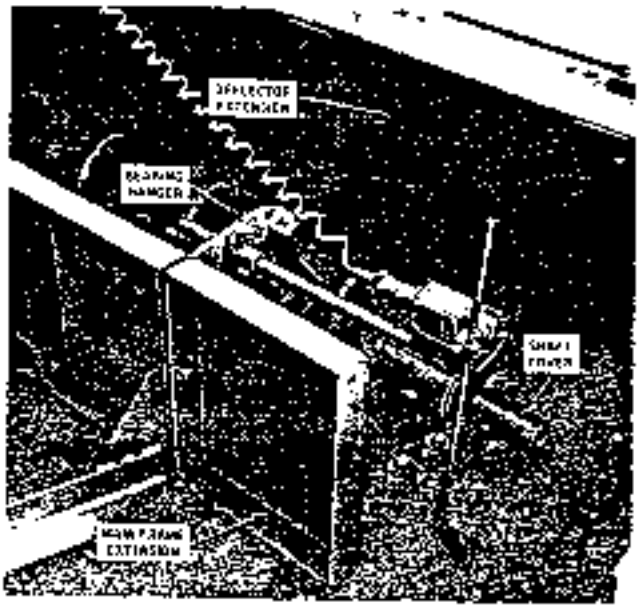


FIGURE F-24 – Extensions

TO INSTALL EXTENSIONS (Refer to Figure F-24)

1. Remove paint from mating edges of screed plates and slots for cam bolts.
2. Set main screed on boards that extend beyond edge of screed so extensions can be positioned.
3. Install bearings, bushings, cam bolts, washers and nuts. (Refer to Figure F-24)
4. Tighten cam nuts just enough to bring screed plates and extensions together, but not enough to raise outer edge of extension.
5. Install square head set screws in holes (A) Figure F-24. Install set screws in main screed frame for right side extension mounting and in extension for left hand mounting.
6. Snug set screws (A) and look. Check main screed plate and extension for level with a straight edge.
7. Adjust cam bolts to match plates and tighten. Refer to Figure F-24 for direction of cam movement. Trailing edge must be flush.

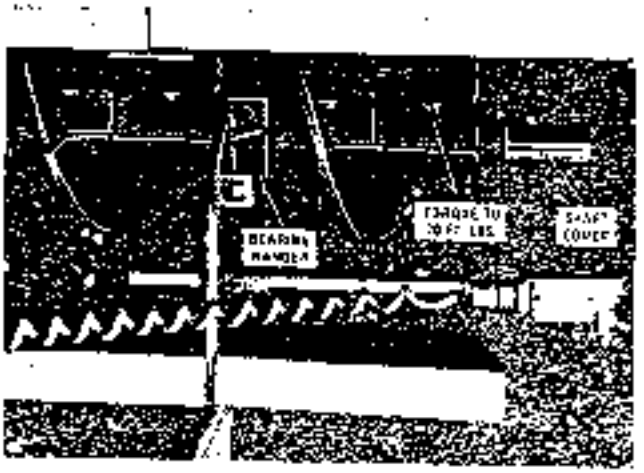


2761783

FIGURE F-26 — Main Frame and Screw Extension

SCREW EXTENSIONS (Refer to Figure F-25)

1. Remove main screw shaft cover and install shaft extension.
2. Install screw segments with teflon washers between shaft and segment and torque to 70 ft. lbs.



2761777

FIGURE F-25 — Screw Extension Set-up

NOTE: Note location of the screw hanger bearings. (Refer to Figure F-26).

3. Install shaft covers.

TO INSTALL MAIN FRAME EXTENSIONS (Refer to Figure F-27)

Main frame extension braces and hanger bearings are required when there is 10' or more of extension on one side.

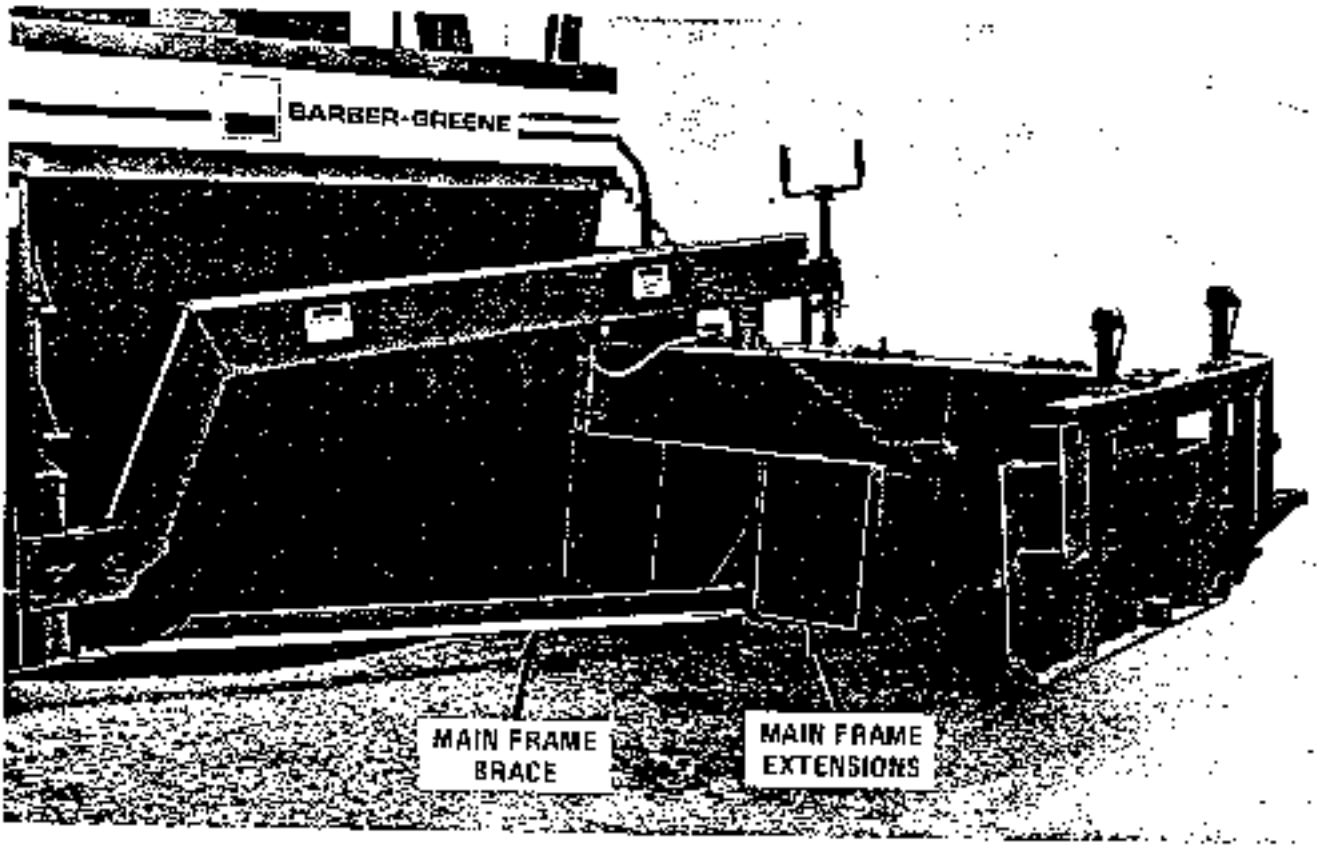
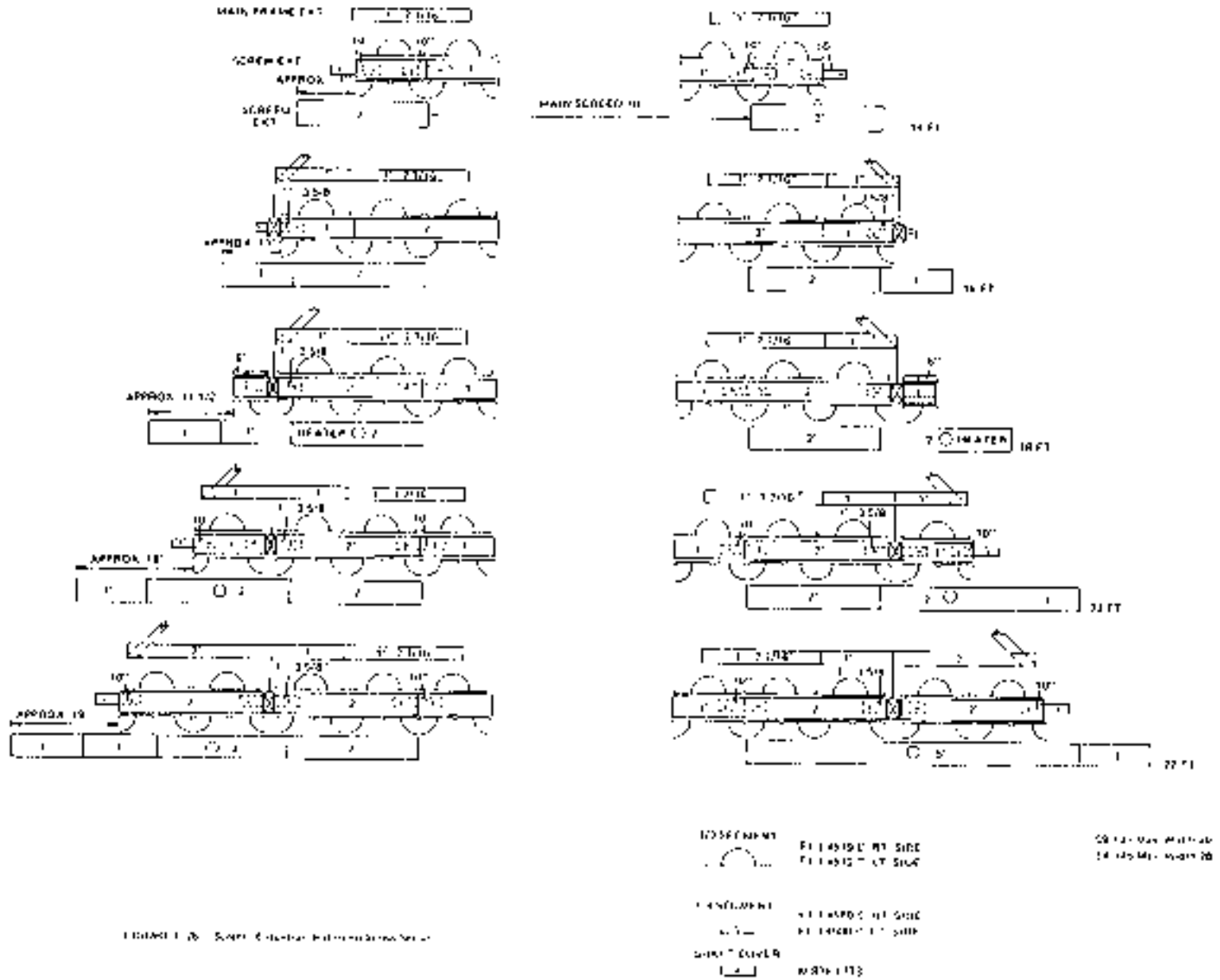
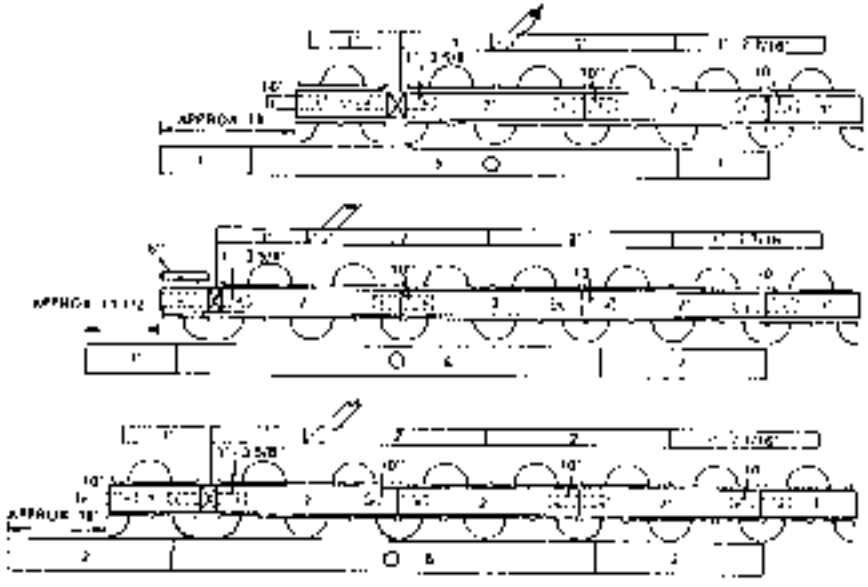
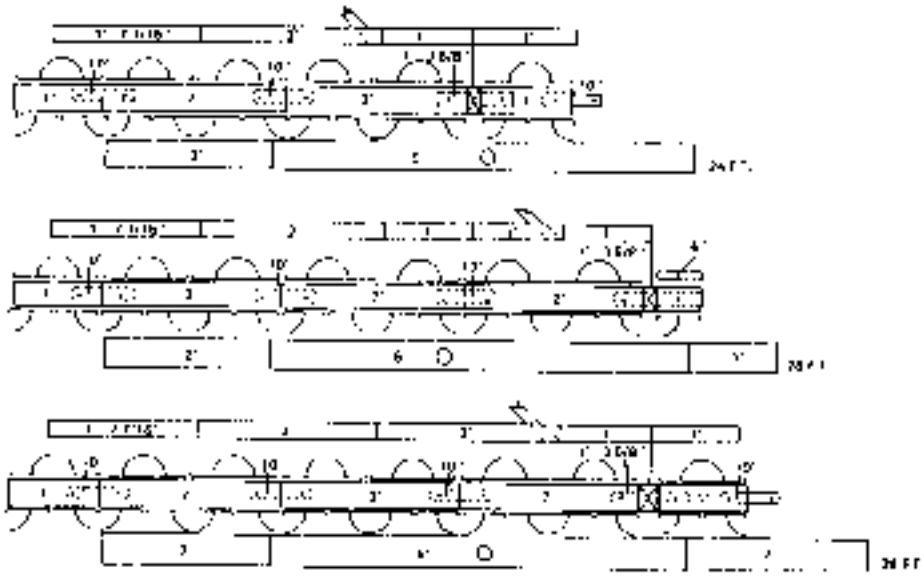


FIGURE F-27 — Main Frame Extensions and Brace

2761778







1. Bolt main frame extension to machine main frame.
2. Install auxiliary frame brace (if required)
3. Move feeder automatic switches outboard.

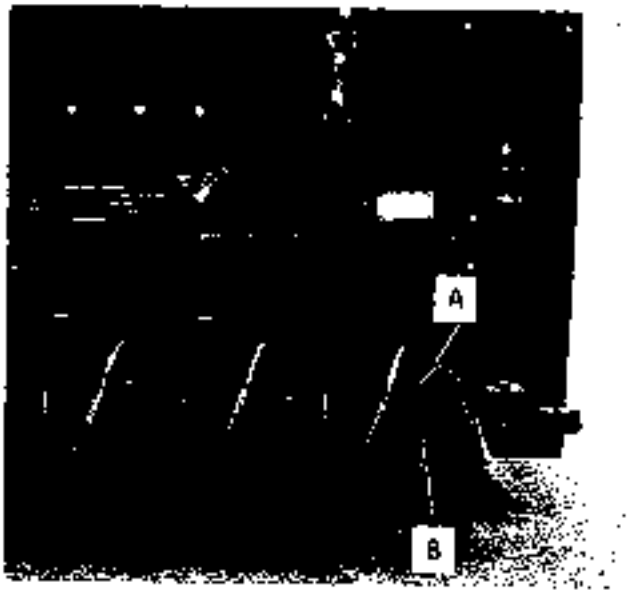


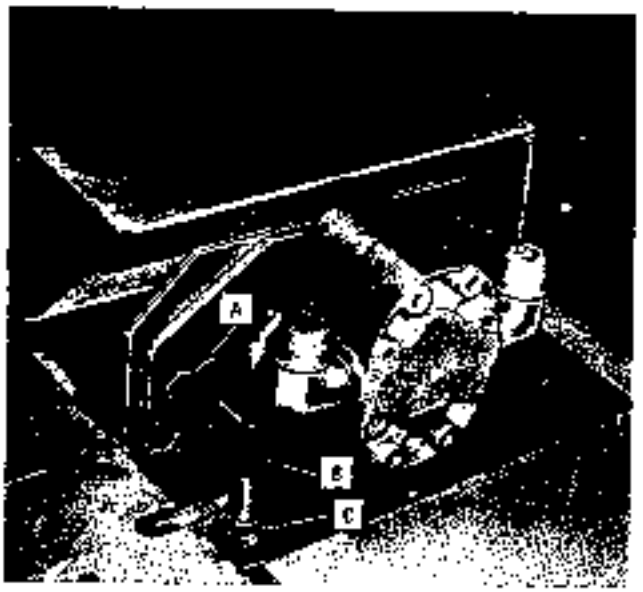
FIGURE F-29 – Spreading Screw

Spreading screw segments should always be removed back 1" from the end plate. For 10' Screed Operation: (Refer to Figure F-29).

1. Remove half segment (A) and quarter segment (B)
2. Install quarter segment (B) where segment (A) was originally. Torque to 70 ft. lbs.
3. Install shaft covers to protect shafts.

For 12' Screed Operation (1' extension each side):

1. Use all of the screw conveyor (A and B segments each side installed).



277431

FIGURE F-30 – Vibrator Drive V-Belts

VIBRATOR DRIVE V-BELTS (Refer to Figure F-30)

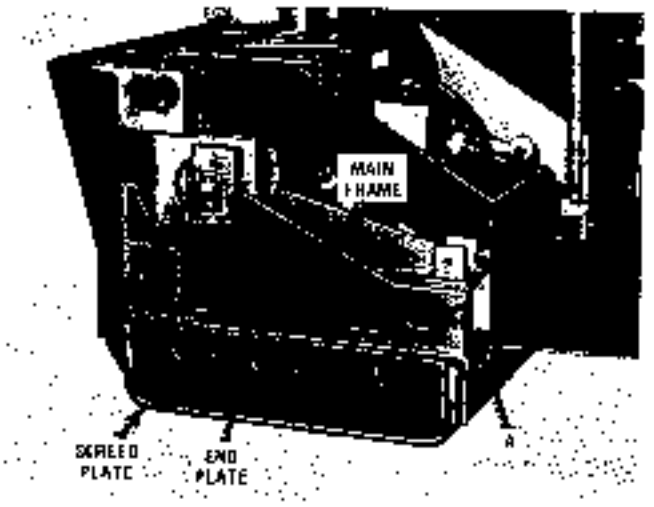
For efficient operation of the vibrators, the drive V-belts must be kept tight

TO ADJUST V-BELTS (Refer to Figure F-30)

1. Loosen mounting bolt (A) and lock nut (C)
2. Turn adjustment bolt (B) until belts deflect approximately 7/32"
3. Tighten lock nut (B) and mounting bolt (A).

TO REPLACE DRIVE V-BELTS

1. Loosen mounting bolt (A) and lock nut (C).
2. Loosen adjustment bolt (B) and slide motor down until belts can be removed from the pulley.
3. Remove the universal joint and remove belts.
4. Reverse above procedure to install the new belts.



277429

FIGURE F-31 – Screed Plate

SCREED PLATES (Refer to Figure F-31)

The screed plate front and trailing edges are identical. Therefore, when wear to the front edges become severe, the plates may be reversed, for maximum wear, before they are replaced.

TO REVERSE PLATE (Refer to Figure F-31)

Remove capscrews (A) holding screed plate to main frame. (Refer to Figure F-31). Raise the screed frame, reverse the two screed plates as a unit and reinstall cap screws Torque screws to 100 ft. lbs.

PRE-STRIKE OFF (Optional)

The pre-strike offs are required only when laying dense "critial" mixes. The pre-strike off should be set about 1/8" above the bottom of the screed. Make adjustments of the pre-strike off and/or vibrating speed until desired mat is obtained.

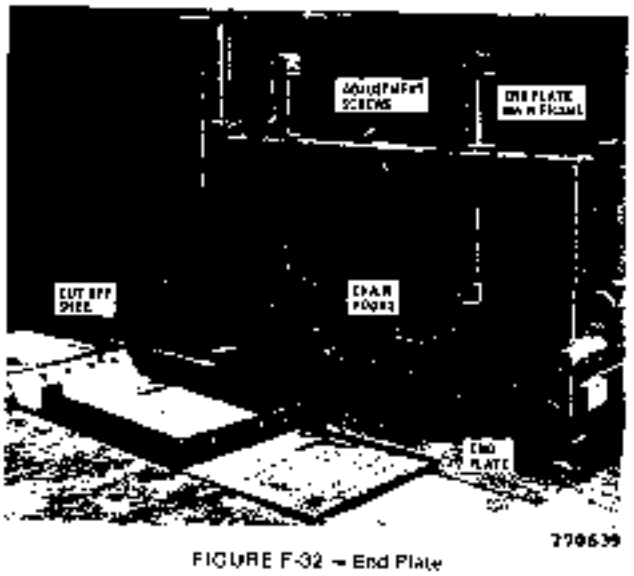


FIGURE F-32 — End Plate

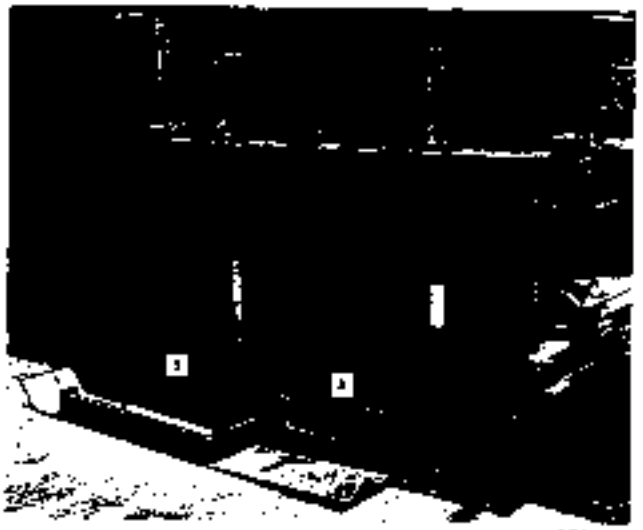


FIGURE F-33 — Cut-off Shoe

END PLATES (Refer to Figure F-32)

End plates are provided to be installed at each end of the spreader screws to hold material within the laying width of the machine and to form the edges of the mat being laid. End plates are standard equipment and always necessary except when bleeding material out to the side.

The end plates, Figure F-32, slide into the guide bar on the end plate main frame.

The chains provided permit adjustment of their position by means of the chain hooks which fasten to clips of the adjustable screws.

CUT-OFF SHOES (Refer to Figure F-33)

The cut-off shoes are used when it is necessary to reduce the laying width between end plates.

There are two furnished with the machine, one providing a maximum of one foot reduction in width, in 3" increments, and the other a reduction of two feet in 3" increments.

TO INSTALL:

1. Select the proper shoe to obtain the width desired.
2. Raise the end plate, Figure F-33, and lay cut-off shoe projecting in toward the spreader screw for the desired amount of width reduction.
3. Now lower the end plate, Figure F-33, into the slot on the shoe.
4. Install keeper pins in hole A and install bolts in hole B.

When cut-off shoes are used, it may be necessary to re-adjust automatic feeder control paddles due to the reduced width.

When operating, do not force excessive material onto the cut-off shoe, as this increases the drag and places excessive strain on the end plate.

CAUTION: Before raising screed to travel position, unlock cut-off shoe from end plates to prevent them from coming in contact with the screw conveyors.

INDEX

G

LUBRICATION

LUBRICATIONS

Nothing can add to the life of the machine more than thorough lubrication of the moving parts, properly executed at the correct intervals. When time and availability of the machine are at a premium, it is absolutely unexcusable to have a breakdown resulting from improper lubrication, since this can so easily be avoided.

LUBRICATING INSTRUCTIONS

Detailed instructions regarding the lubrication of the Finisher are given in the Lubrication Chart and the Lubrication Drawing on the following pages. The Lubrication Chart specifies the points to be serviced, the hourly intervals, the type and quantity of the lubricant to be used, and specific instructions regarding the service to be performed. The Lubrication Drawing, Figure 1, is used for identification and location of the various points of lubrication and service.

ANTI-FRICTION BEARINGS

The anti-friction bearings used on the Finisher have been lubricated at the factory. The grease cannot be seen since it is concealed within the bearings by the grease retainer seals.

Over-greasing distorts and damages these seals allowing dirt to enter and greatly shorten the life of the bearing.

NEVER USE A POWER OPERATED GREASE GUN ON ANTI-FRICTION BEARINGS.

LUBRICATE ONLY AS DIRECTED IN THE LUBRICATION CHART

The number of shots of grease from the grease gun is based on greasing with a standard 13 oz. hand gun delivering 1 oz. of grease to 54 shots of the gun, using the recommended grease. One shot of the gun = 1.54 oz. of grease.

An operator who knows the value of proper lubrication is a credit to himself and is an asset to his employer. In doing so he cuts down lost time and increases the life of the machine.

1. He keeps his grease gun clean and wipes each grease fitting with a clean cloth to prevent grit from being pumped into the bearings.
2. He keeps his grease and oil containers clean and their covers in place, except when using, to keep dust and dirt out of the lubricant.
3. He keeps each lubricant container well labeled and makes no mistake in using the correct lubricant in the right places.
4. He has studied his lubrication charts and does not guess when lubricating his machine.
5. He keeps his machine as clean as possible and removes all excess grease and oil which may accumulate during the day.
6. WHEN LUBRICATING BALL OR ROLLER BEARINGS BE IS CAREFUL NOT TO BLOW THE SEALS THROUGH OVERGREASING.

KEY	BELOW + 32°	+ 32° TO + 75°	ABOVE + 75°	SPECIFICATIONS
EO	REFER TO ENGINE MANUFACTURERS MANUAL			Engine Oil MIL-L-2104 Type
MPL	Grade 80	Grade 90	Grade 90	Above 90° use grade 140. Multi-purpose Gear Lube MIL-L-2105 Type
HTG	No. 2 consistency, lithium base grease. Viscosity @ 100° F - 927 @ 210° F-79. 386° dropping point, penetration worked @ 77° F. 270 - 295			Texaco No. 1917 or Equivalent
BF	Brake Fluid (Heavy Duty)			Wagner No. 218 or Equivalent
HO	FLUID TYPES MEETING THESE SPECS.			

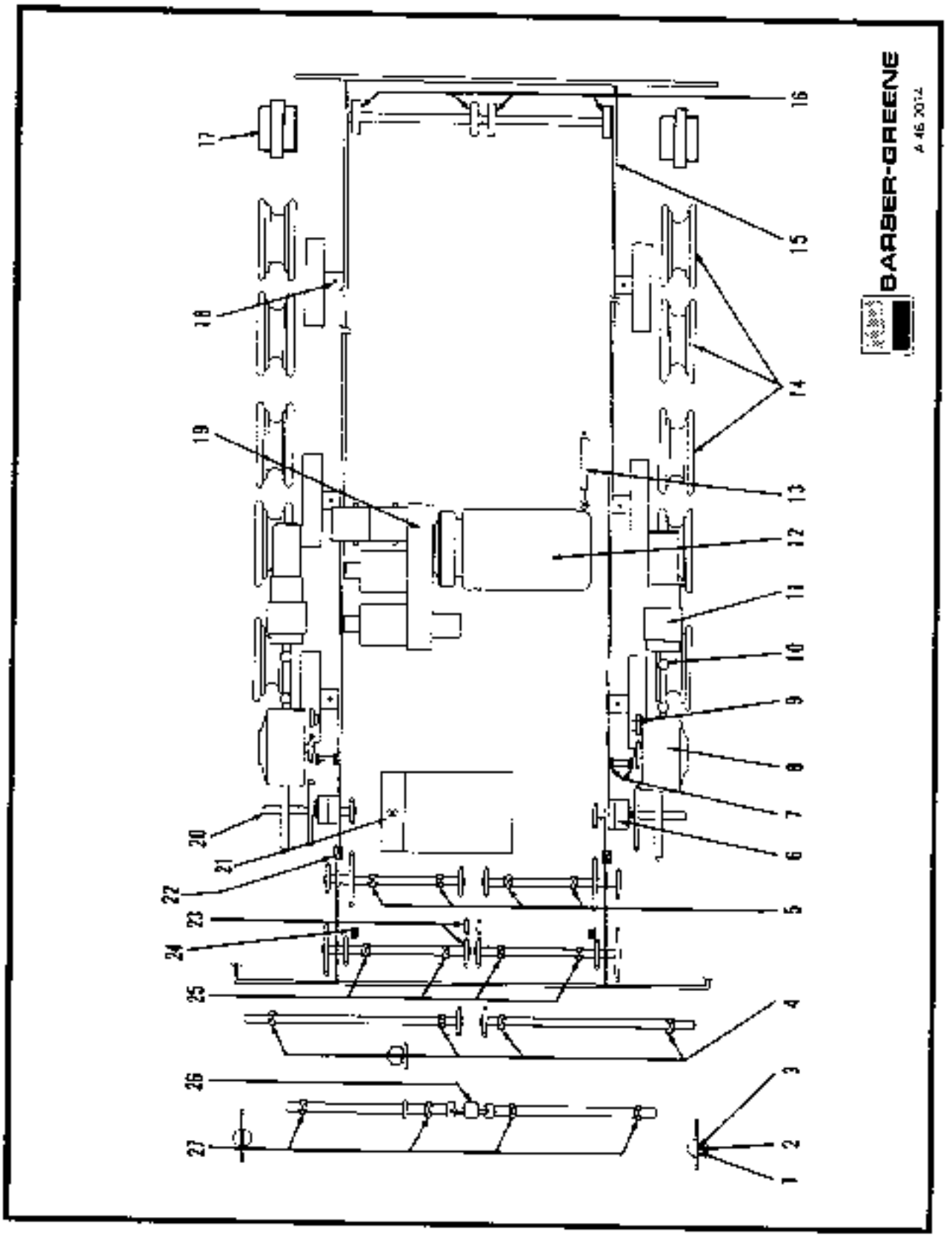
Fluid Type	Typical Viscosity SUS 0°	100° F	210° F	Viscosity Index	Pour Point ° F	Operating Range (Typical °F)
Anti-Wear Hydraulic Oil	7,000	200	50	132	-30	+10 - 200° F.
Type "F"	5,000	200	53	170	-40	-10 - 200° F.
Hydraulic Transmission	12,000	237	49	100 Min.	-35	+15 - 200° F

NOTE: Refer to Section J-3 for additional Hydraulic Oil Information.

LUBRICATION CHART SA-145 FINISHER

INTERV. HOURS	PT.	IDENTIFICATION	NO. OF POINTS	TYPE OF LUBE	QUAN.	REMARKS
	F2	Engine Crankcase and Components	Refer to Engine Operator's Manual Furnished in Addition to This Manual			
10	4	Screw Conveyor Bearings	4	HTG	Purge	Grease While Hot
	10	Feeder Foot Shaft Bearings	4	HTG	Purge	Grease While Hot
	21	Hydraulic Oil Tank	1	HO		Check Level at Sight Gauge
	25	Feeder Hd Shaft Brgs.	4	HTG	Purge	Grease While Hot
50	1	Thickness Control Screw (Upper Brg.)	2	HTG	1 Shot	
	2	Thickness Control Screw (Thd. Bodyl	2	HTG	Purge	
	3	Thickness Control Screw (U-Joint)	2	HTG	1 Shot	
	5	Feeder Drive Countershaft Bearings	4	HTG	2 Shots	
	8	Feeder Drive Motor Reducer	2	MPL	1 Pint	Check Level Plug on Side. Drain, Flush and Refill 1st 50 hrs. Do Not Pressure Fill
	7	Pump Control Shaft Bearings	2 L. Side 3 R. Side	HTG	1 Shot	
	6	Crawler Gear Box	2	MPL		Check Level at Sight Gauge
	9	Crawler Drive Chain Take-up	2	HTG	2 Shots	
	10	Transmission Drive U Joints	3 ea. Side	HTG	1 Shot	
	11	Crawler Drive 3-Speed Box	2	MPL		Check Level at Level Plug
	13	Hopper Cylinder Ends	2 ea. Side	HTG	2 Shots	
	15	Feeder Foot Shaft Take up Slides	2	HTG		Coat With Grease
	18	Main Crawler Suspension	3 ea. Side	HTG	Purge	
	16	Pump Drive Gear Box	1	HO		Check Level at Sight Gauge
50	22	Transmission Shaft Brgs.	1 ea Side	HTG	1 Shot	
	23	Feeder Screw Drive Chain Idler and Take up	2	HTG	1 Shot	
	24	Throttle Linkage Brgs	1 ea. Side	HTG	1 Shot	
	26	Vibrator Slip Shaft and U Joint	3	HTG	1 Shot	
	27	Vibrator Shaft Bearings	4	HTG	2 Shots	
250		Hydraulic Oil Filters	All			Replace First 50 Hrs. Every 250 Hrs. Thereafter
1000 or Seasonal	8	Feeder Drive Motor Reducer	2	MPL	1 Pint	Drain, Flush and Refill. Do Not Pressure Fill.
	8	Crawler Gear Box	2	MPL	Approx 8 Qts.	Drain, Flush and Refill
	11	Crawler Drive 3 Speed Box	2	MPL	Approx. 3 Qts.	Drain, Flush and Refill
	14	Crawler Rollers	6 ea Side	HTG		Clean and Repack
	17	Crawler Take-up Idler Roller	2	HTG		Clean and Repack
	19	Pump Drive Gear Box	1	HO	Approx. 8 Qts.	Drain, Flush and Refill.
	20	Crawler Drive Sprocket	2	HTG		Clean and Repack
	21	Hydraulic Oil Tank	1	HO	Approx. 50 Gals.	Drain, Flush and Refill. Clean Strainer.

EO – Engine Oil – Military Equivalent M L L 2104 Type
HTG – Texaco No. 1917 or Equivalent
MPL – Multipurpose – Gear Lubricant – Military Equivalent MIL L 2105 Type
HO – Hydraulic Oil – Grade mil No. 100 or Equivalent
NOTE: Refer to OSM for hydraulic oil equivalents



10 HOUR LUBRICATION

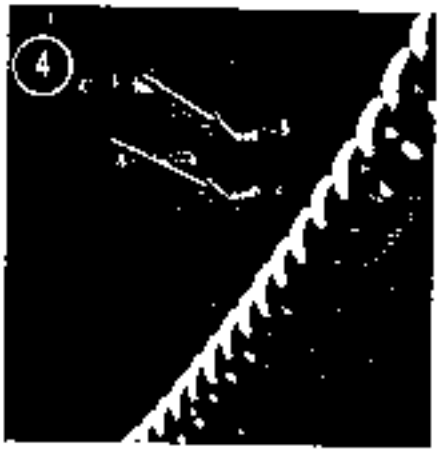
POWER UNIT - - Refer to Manufacturer's Manual Furnished In Addition to this Manual

2761657

FOOT SHAFT BEARINGS - 4

HTG - - Purge out old grease and dirt.

Purge while hot.

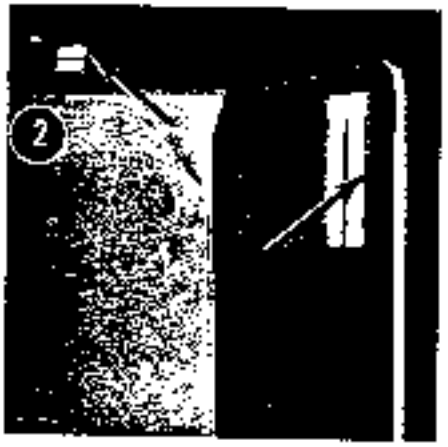


2761069

HEAD SHAFT BEARINGS - 4 (2 each side)

HTG - - Purge out old grease and dirt.

Purge while hot.



277423

HYDRAULIC TANK

HO - - Check and fill if low.

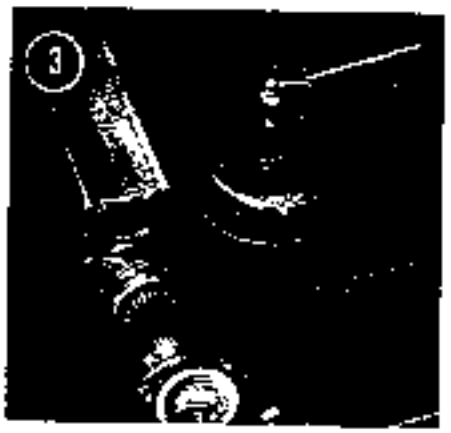
Check breather cap.

277553

SCREW CONVEYOR BEARINGS (INBOARD) - 2

HTG - - Purge out old grease and dirt.

Purge while hot.



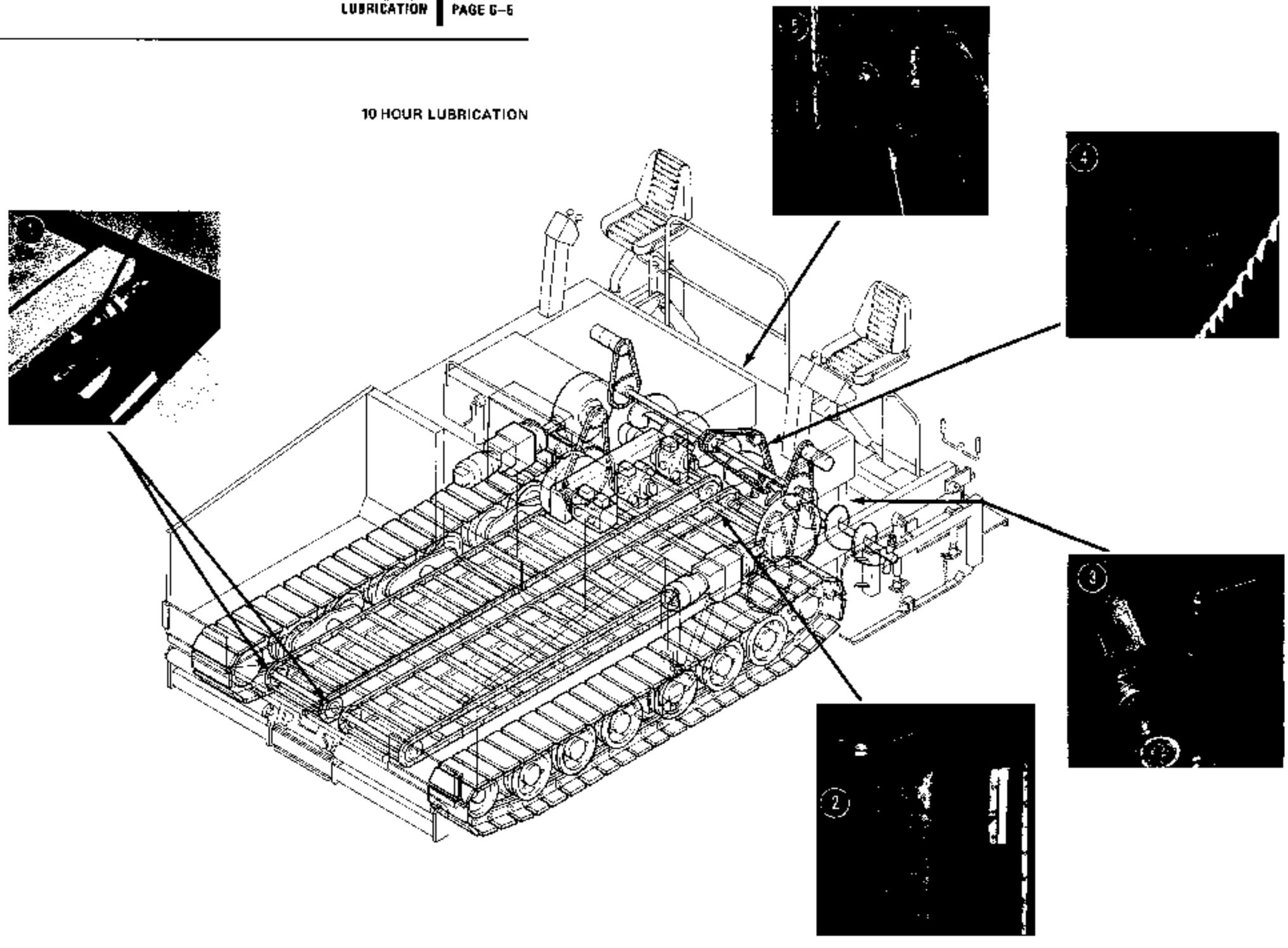
276367

SCREW CONVEYOR BEARINGS (OUTBOARD) - 2

HTG - Purge out old grease and dirt.

Purge while hot.

10 HOUR LUBRICATION



50 HOUR LUBRICATION

278102

HOPPER CYLINDER - (2 each side)
MTG - - 2 Shots.

277435

VIBRATORY DRIVE SLIP SHAFTS
MTG - - 1 Shot each

277718

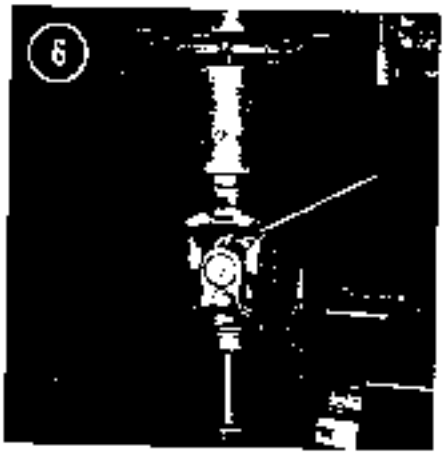
CRAWLER DRIVE 3-SPEED BOX - 2
(Level Plug)
MPL - Check and fill if low

277719

THICKNESS CONTROL THREAD BODY - 2
MTG - - 2 Shots.

276807

FEEDER COUNTERSHAFT BEARINGS - 4
MTG - - 2 Shots.



277719

THICKNESS CONTROL U-JOINT - 2
MTG - - 1 Shot

50 HOUR LUBRICATION

277179

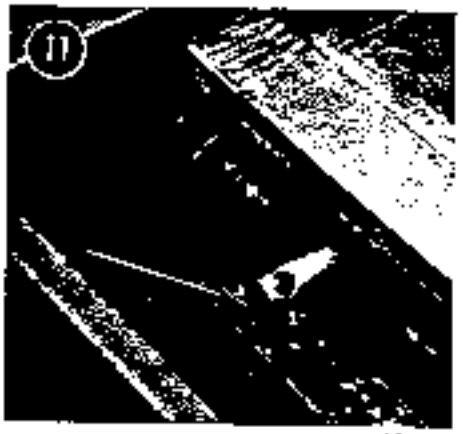
THICKNESS CONTROL LOWER BRG. - 2
HTG - - 1 Shot

2761878

PUMP DRIVE GEAR BOX - 1
(Hall sight gauge)
HO - - Check and fill if low

277072

CRAWLER DRIVE GEAR BOX - 2
(Hall sight gauge)
MPL - - Check and fill if low

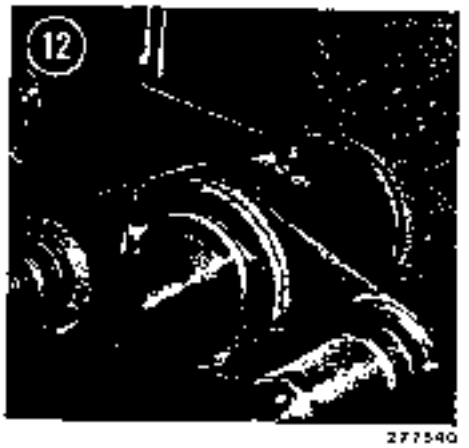


276744

FOOT SHAFT TAKE-UP SLIDE - 2
(1 each side)
Coat with grease.

277549

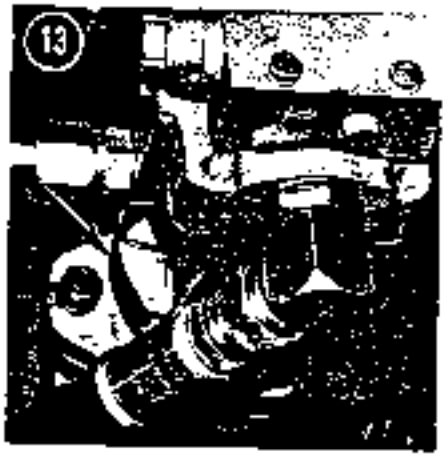
TRANSMISSION DRIVE U-JOINT - 6
(3 each side)
HTG - - 1 Shot



277540

MAIN CRAWLER SUSPENSION - 6
(3 each side)
HTG 2 Shots

50 HOUR LUBRICATION

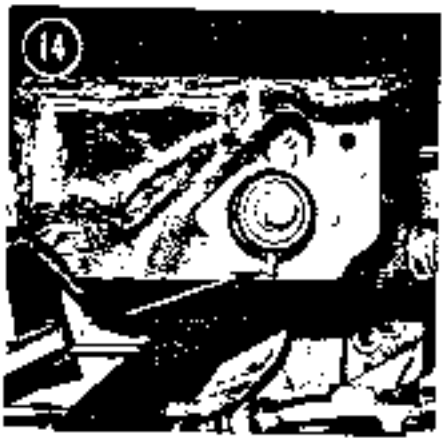


277338

FEEDER DRIVE MOTOR REDUCER - 2
MPL - Approx. 1 Pint.
(Change first 50 hours)

276658

VIBRATORY SHAFT BEARINGS - 4
HTG - 2 Shots

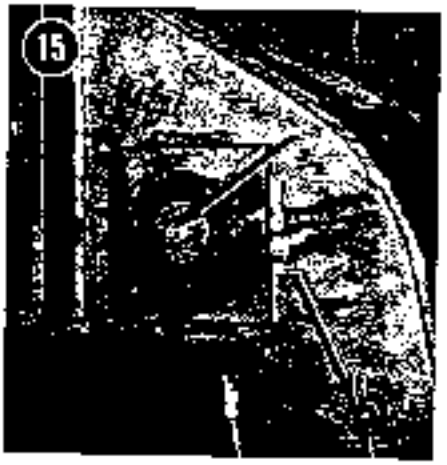


277072

PUMP CONTROL SHAFT BRG. - 5
(2 L. & de-3 R. Side)
HTG - - 1 Shot

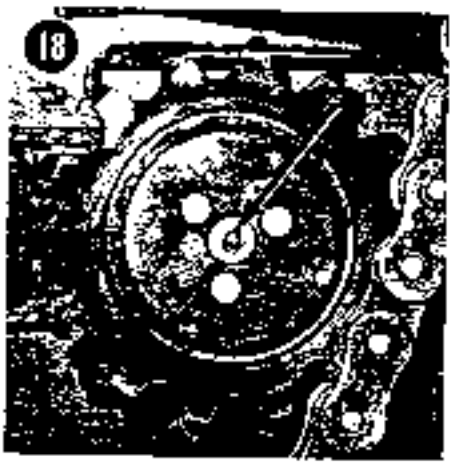
277557

TRANSMISSION SHIFT BRG. - 2
(1 each side)
HTG - - 1 Shot



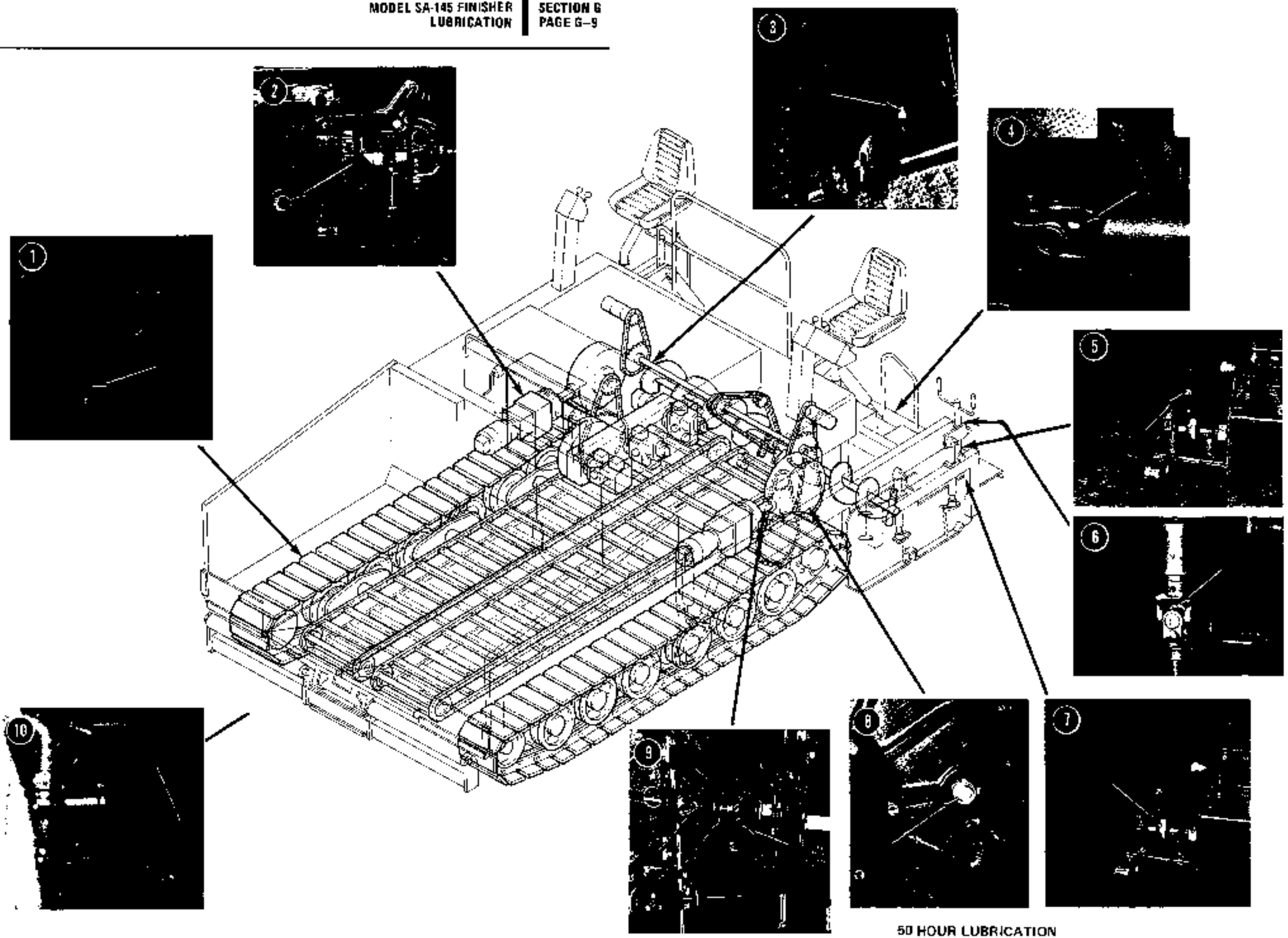
277553

FEEDER TAKE-UP & IDLER - 2
HTG - - 1 Shot



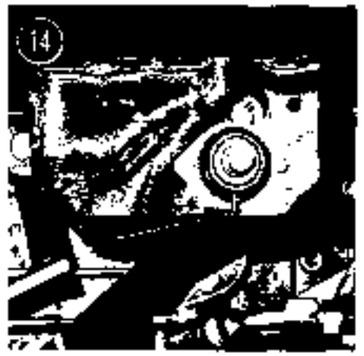
277551

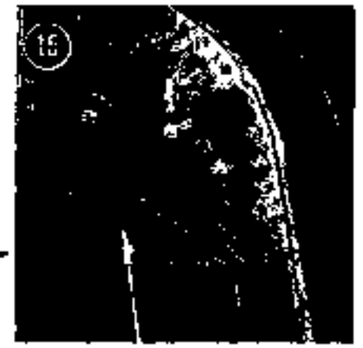
CRAWLER DRIVE CHAIN TAKE-UP - 2
(1 each side)
HTG - - 2 Shots

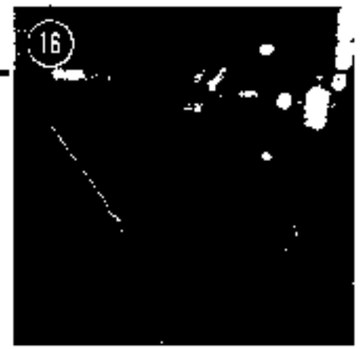


50 HOUR LUBRICATION

50 HOUR LUBRICATION

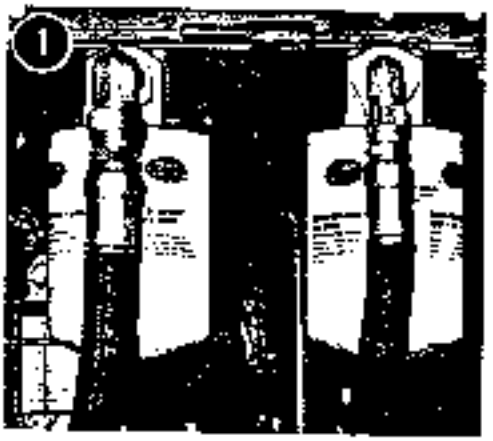






250, 500 and 1000 HOUR LUBRICATION (OR SEASONAL)

250 HOURS LUBRICATION



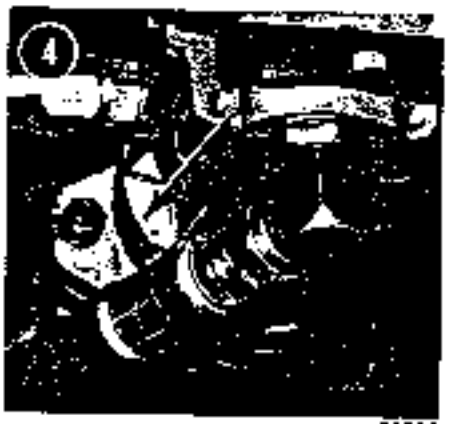
277218

ALL HYDRAULIC FILTER
Change Element

1000 HOURS LUBRICATION

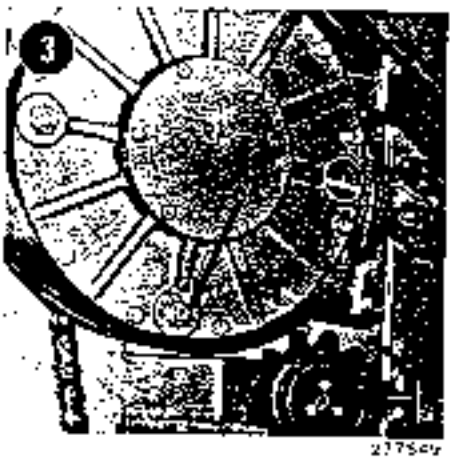
277551

CRAWLER DRIVE 3-SPEED BOX - 2
Drain, Flush and Refill
MPL - 3 Quarts



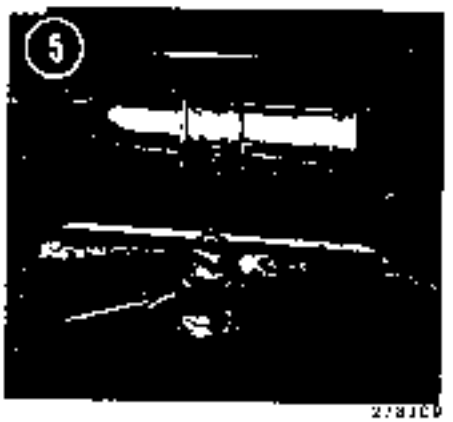
277724

FEEDER DRIVE MOTOR REDUCER - 2
MPL - Approx. 3 Pt.
(Do not pressure fill)



277547

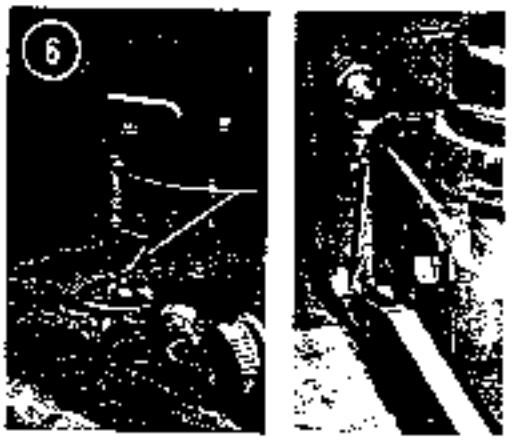
CRAWLER DRIVE GEAR BOX - 2
Drain, Flush and Refill
MPL - 9 Quarts



278109

PUMP DRIVE GEAR BOX - 1
Drain, Flush and Refill
HO 8 Quarts

1000 HOUR LUBRICATION

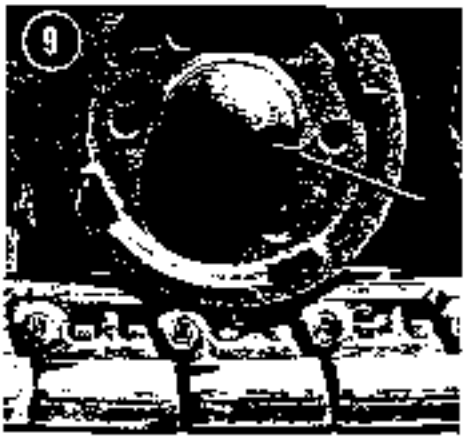


27084

TRANSVERSE BEAM ENDS

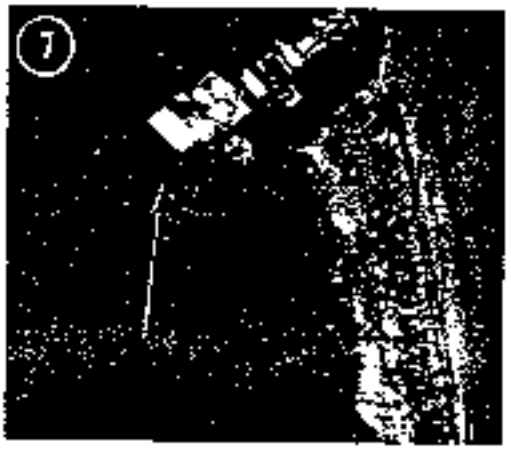
Left Side L-Joint - 2
HTG - - 1 Shot

Right Side Rod End - 1
HTG - - 1 Shot



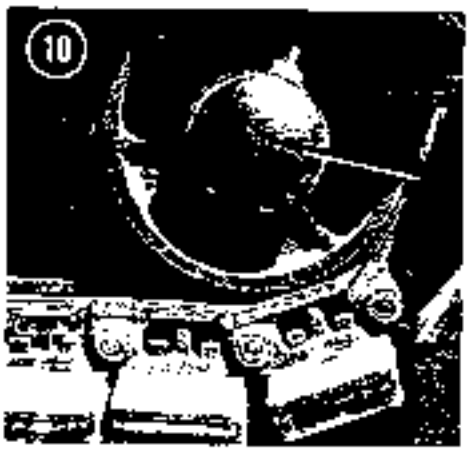
2771130

CRAWLER ROLLERS - 12
(6 each side)
HTG - - Clean and Repack



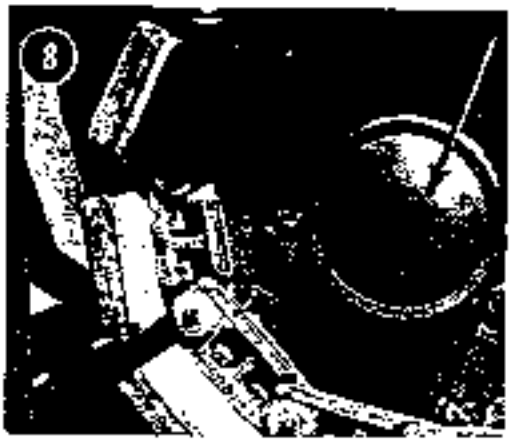
278109

HYDRAULIC OIL TANK - 1
Drain, Flush and Refill
HO - - 50 Gallons



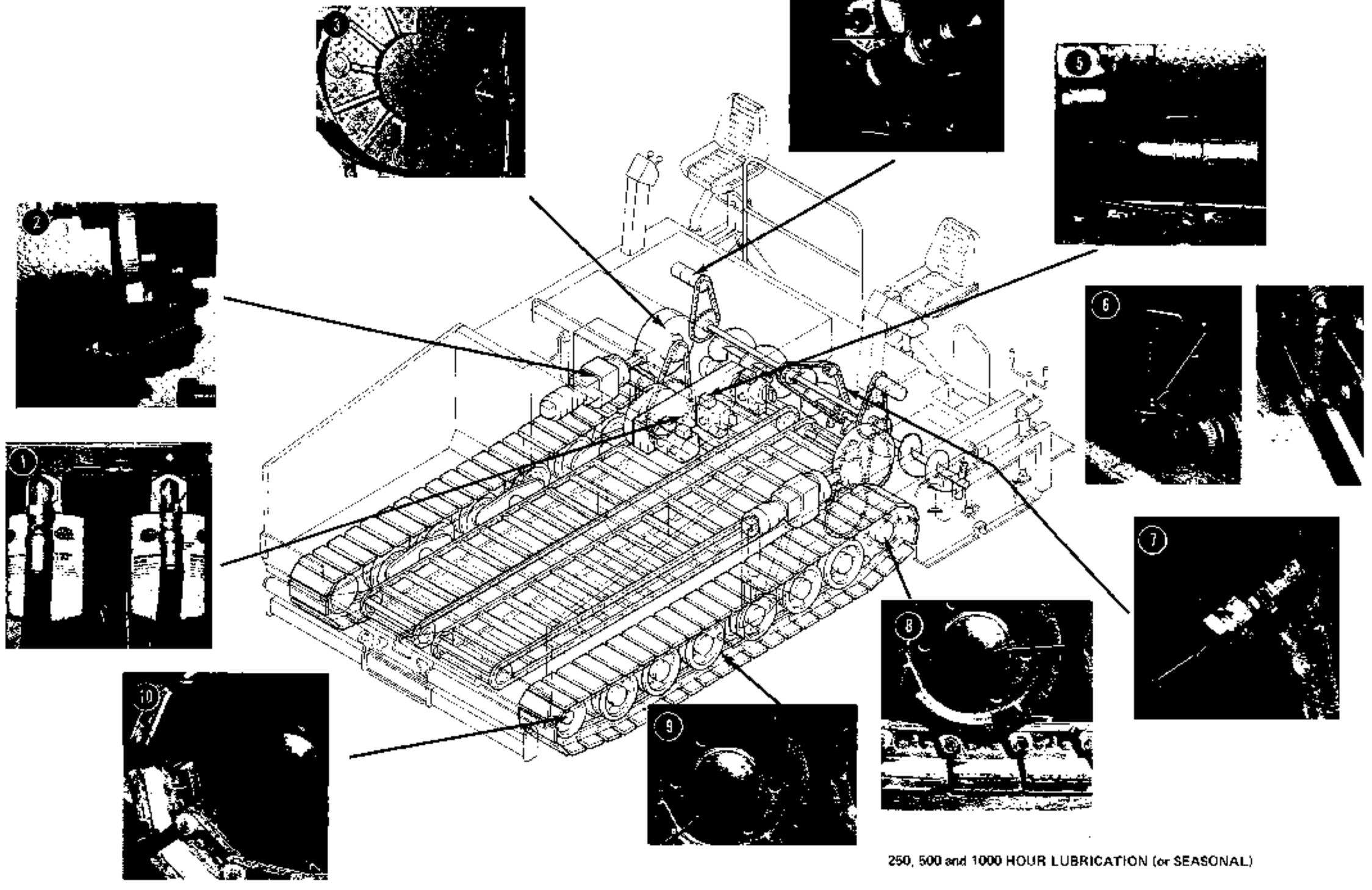
2771189

CRAWLER DRIVE SPROCKET - 2
(1 each side)
HTG - - Clean and Repack



2771189

CRAWLER TAKE-UP IDLER - 2
(1 each side)
HTG - - Clean and Repack



250, 500 and 1000 HOUR LUBRICATION (or SEASONAL)

INDEX

Item No.	Description
1	Hopper Material Retainer
2	Crawler Take-up
3	Plate Roller
4	Plate Roller Cover
5	Crawler Drive Shaft
6	Crawler Drive Sprocket
7	Crawler Take-up Idler
8	Adjustable Feeder Gate
9	Crawler Roller
10	Tow Beam Pin
11	Transfer Shaft
12	Left Crawler Drive Sprocket
13	Left Crawler Drive Shaft
14	Left Crawler Drive Gear
15	Feeder Screw Sprocket
16	Feeder Screw Gear
17	Feed Plate
18	Feed Plate Main Cylinder
19	Hopper Conduit Cover
20	Screed Oscillator Bearing Cylinder
21	Left Crawler Drive Sprocket
22	Screed Oscillator
23	Screw Conveyor Drive Sprocket
24	Screw Conveyor Take-up Sprocket
25	Screw Conveyor Gear Shaft
26	Screw Conveyor Drive Sprocket
27	Front Idler
28	Screw Conveyor
29	Conveyor Drive Sprocket
30	Conveyor Drive Shaft
31	Conveyor Drive Sprocket
32	Conveyor Extension Box
33	Feeder Gate Adjustment Screw
34	Conveyor Gear Support Box
35	Conveyor Hopper Front
36	Feeder Chain Bar
37	Feeder Flight Chain
38	Hopper

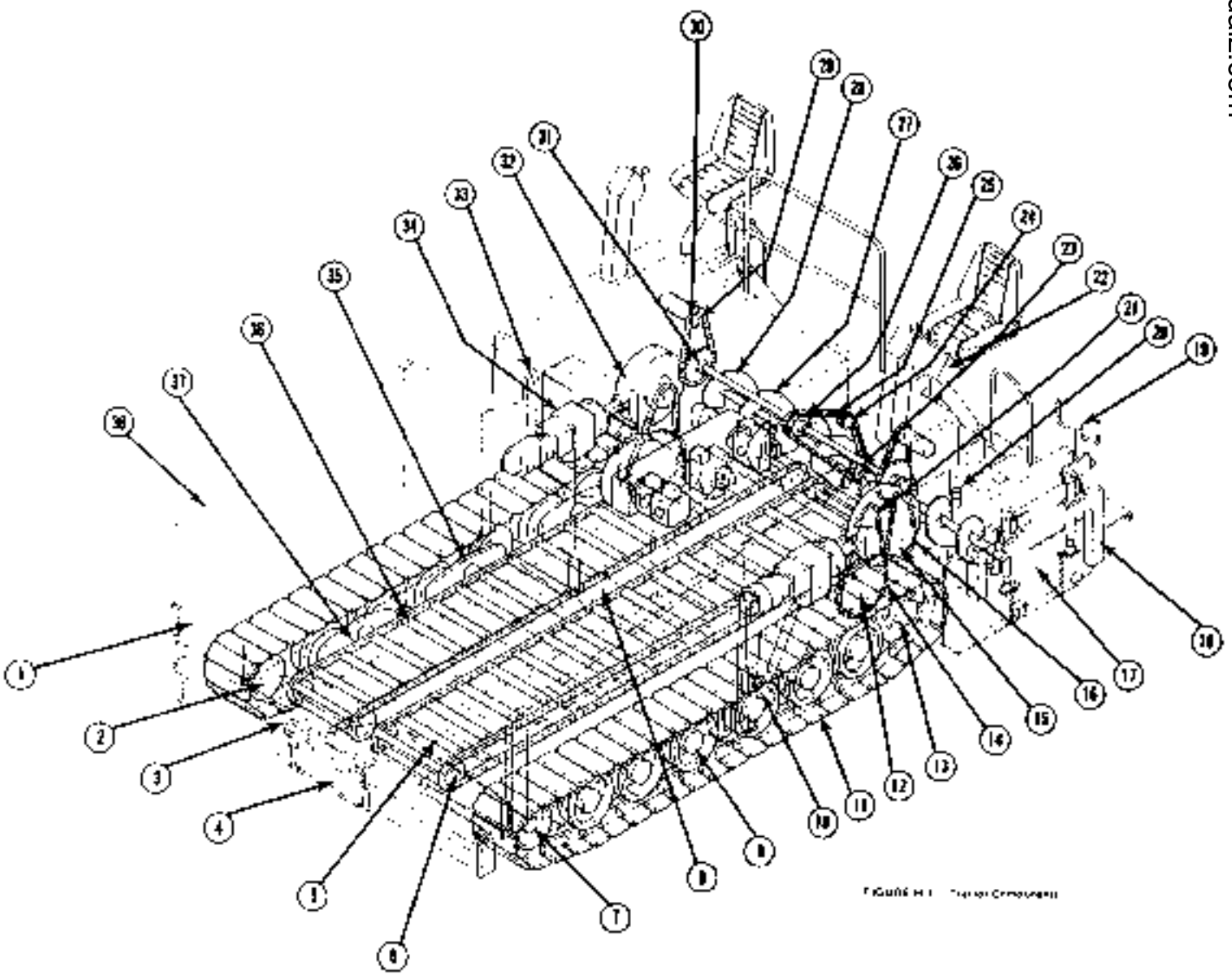


FIGURE H-1 - Typical Components

Item No.	Description
1	Left Hopper Cylinder
2	Screed Lift Valve
3	Hopper Valve
4	Track Lift Valve
5	Feeder Speed Control Actuator
6	Feeder Hydrostatic Pumps
7	Propel Hydrostatic Pumps
8	S-D-S Pump
9	Hydraulic Filters
10	Left Crawler Hydrostatic Motor
11	Tank Strainer
12	Tank Breather
13	Left Feeder Hydrostatic Motor
14	Screed Drive Motor
15	Left Screed Lift Cylinder
16	Vibrator Speed Control Manifold
17	Right Screed Lift Cylinder
18	Right Feeder Hydrostatic Motor
19	Return Filter
20	Cooler
21	Right Crawler Hydrostatic Motor
22	Right Hopper Cylinder

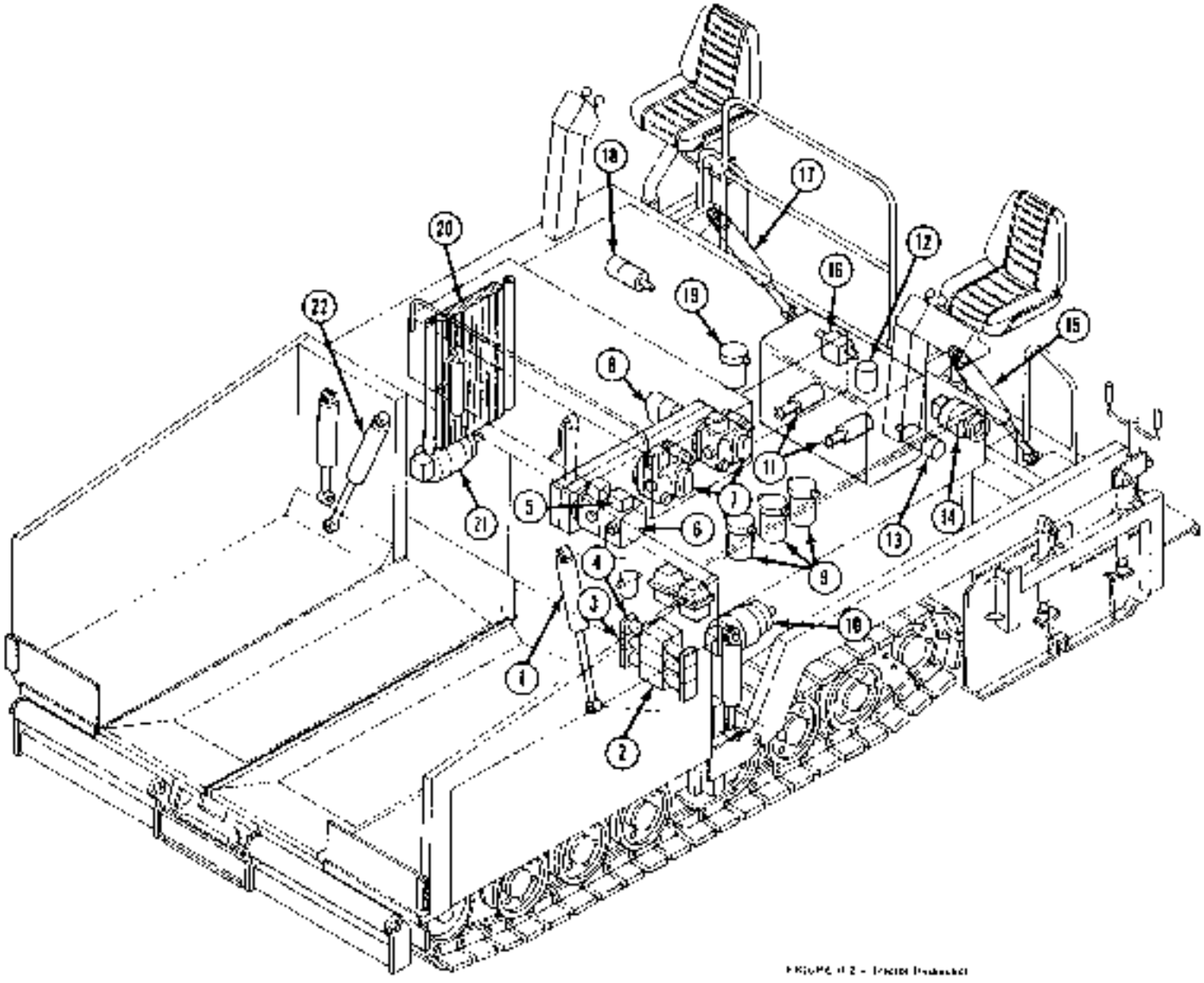


FIGURE H-2 - Finisher Hydraulics

Item No	Description
1	Left Leveling Cylinder
2	Lock Valve
3	Left Servo Valve
4	Dump Valve
5	Right Servo Valve
6	Grade Control Lever
7	Right Leveling Cylinder

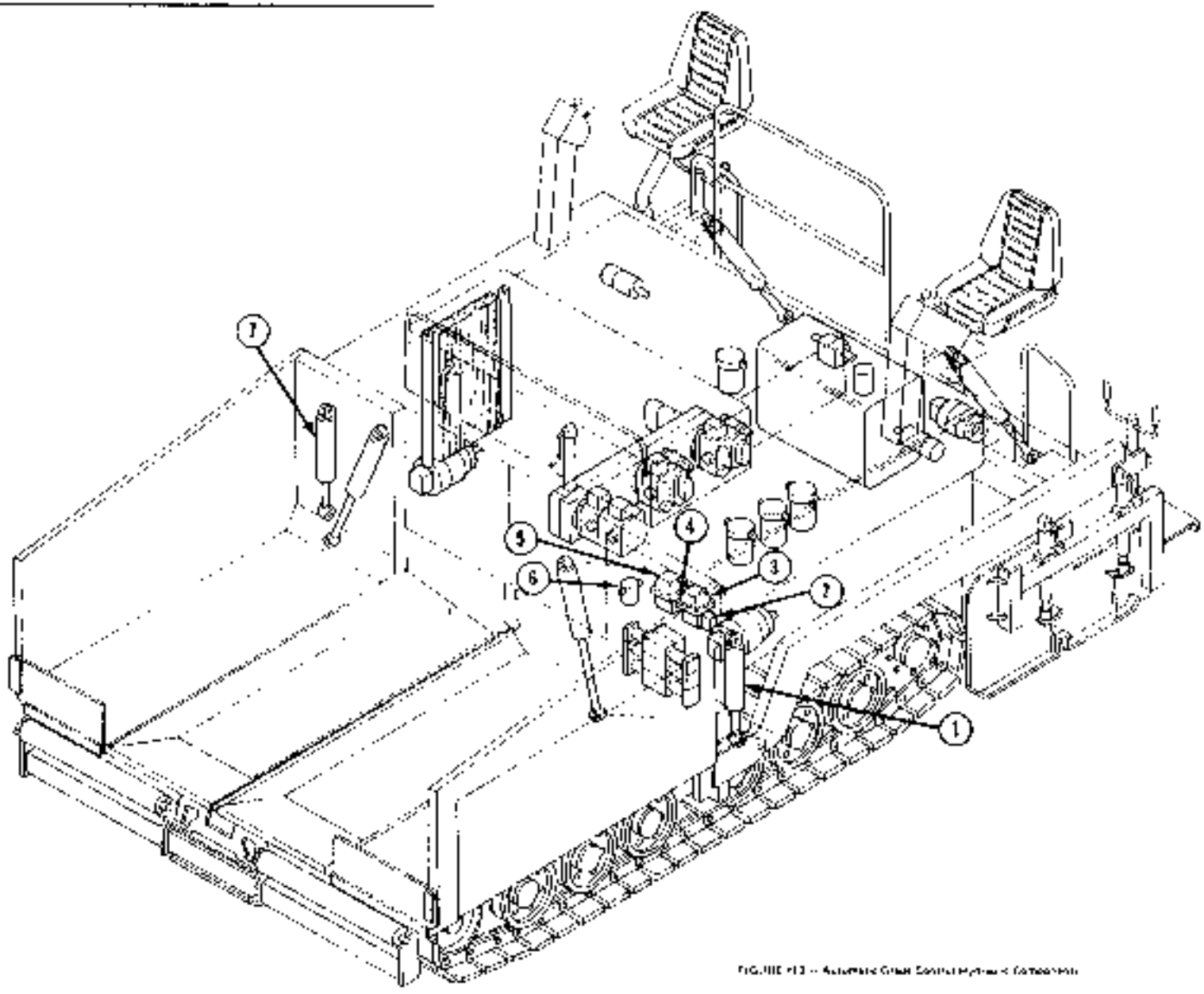
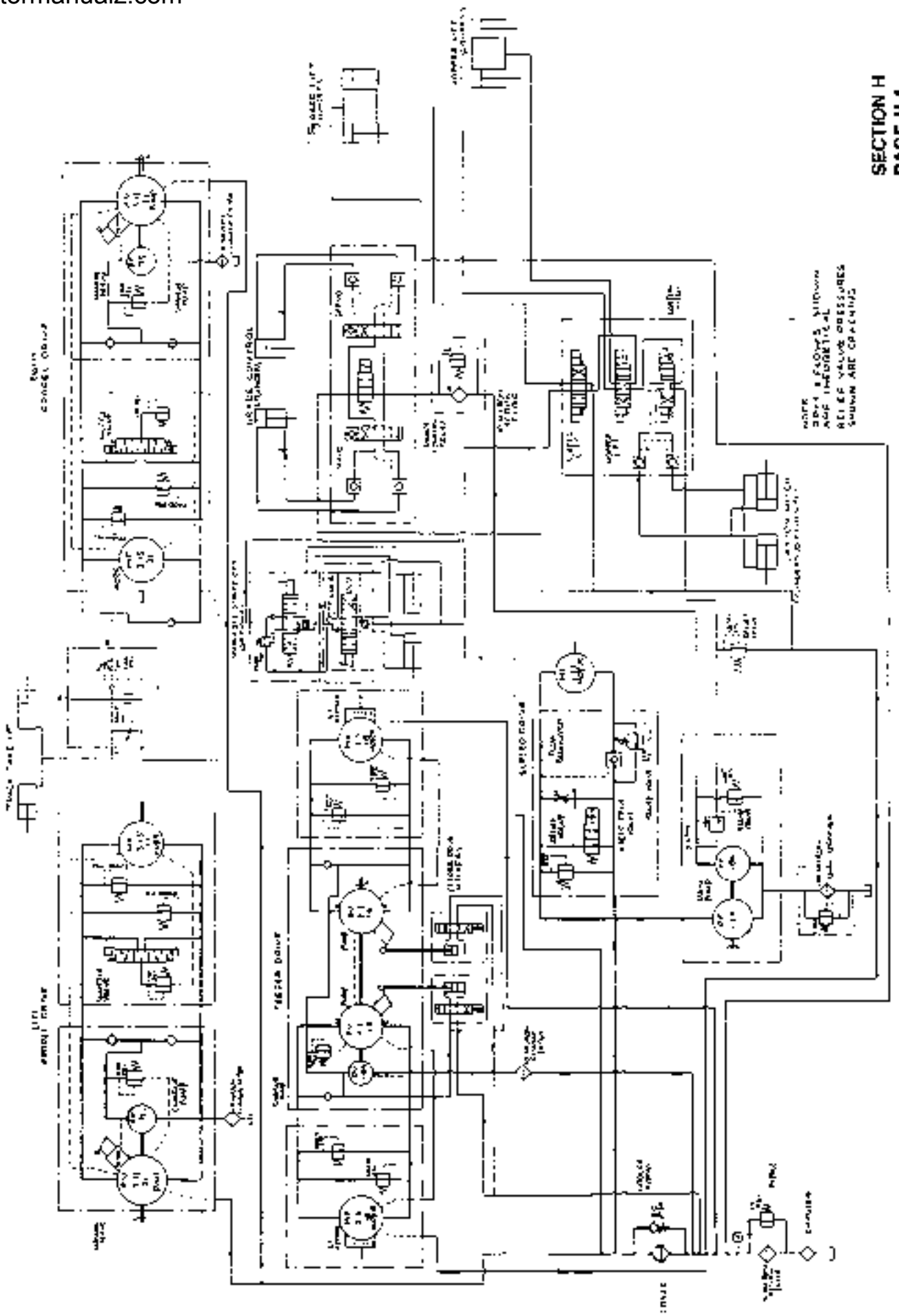
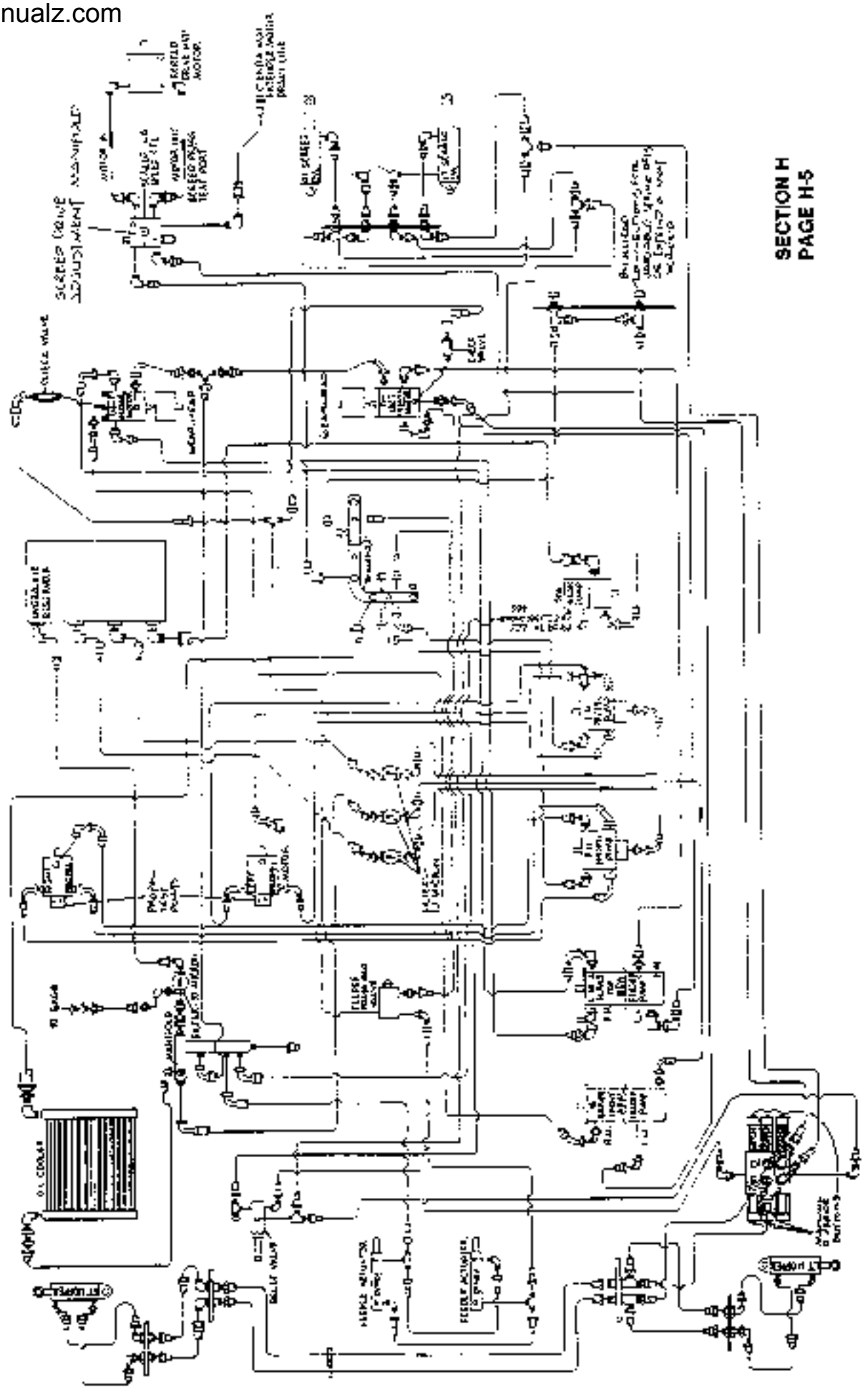


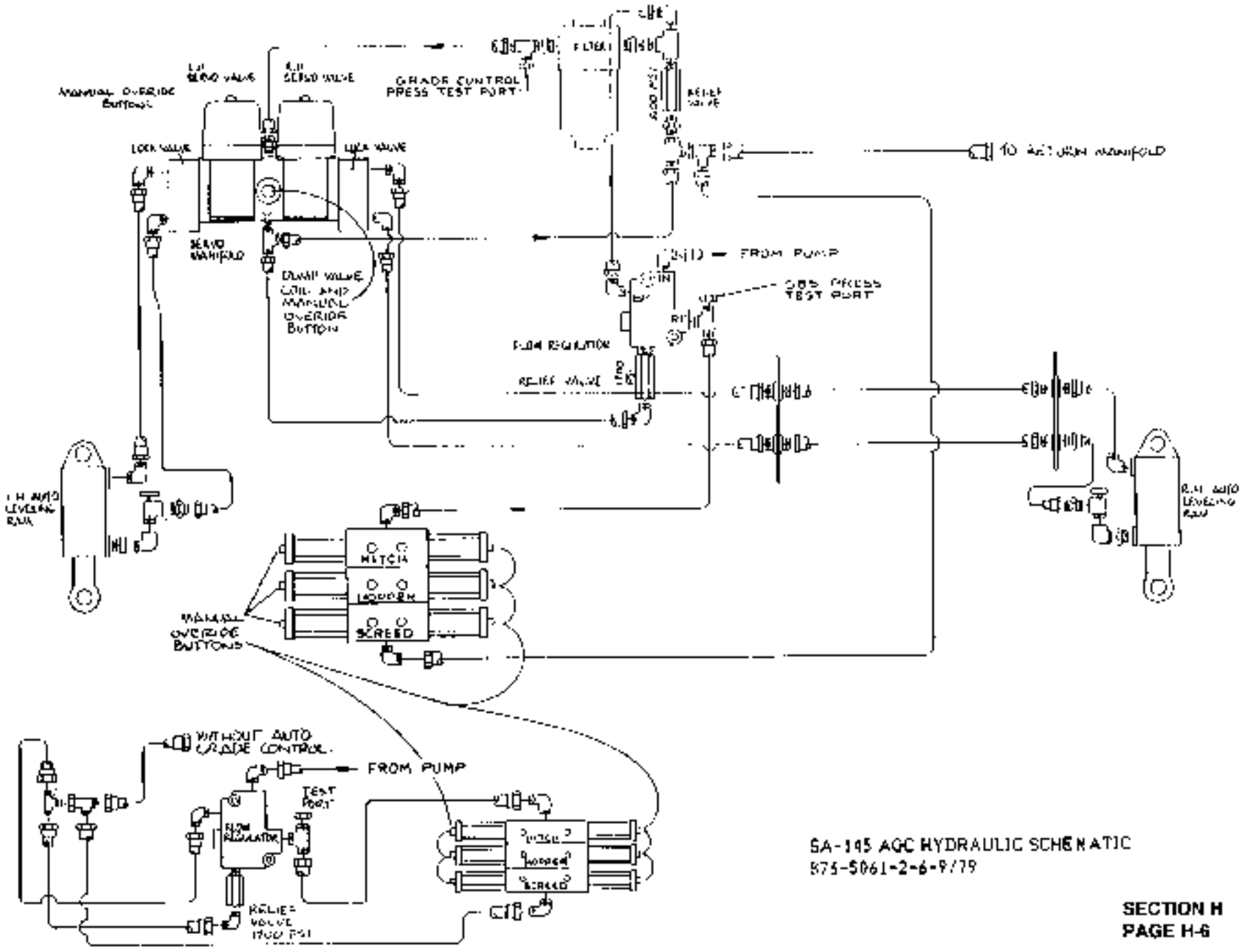
FIGURE H-3 -- Automatic Grade Control Hydraulic Components



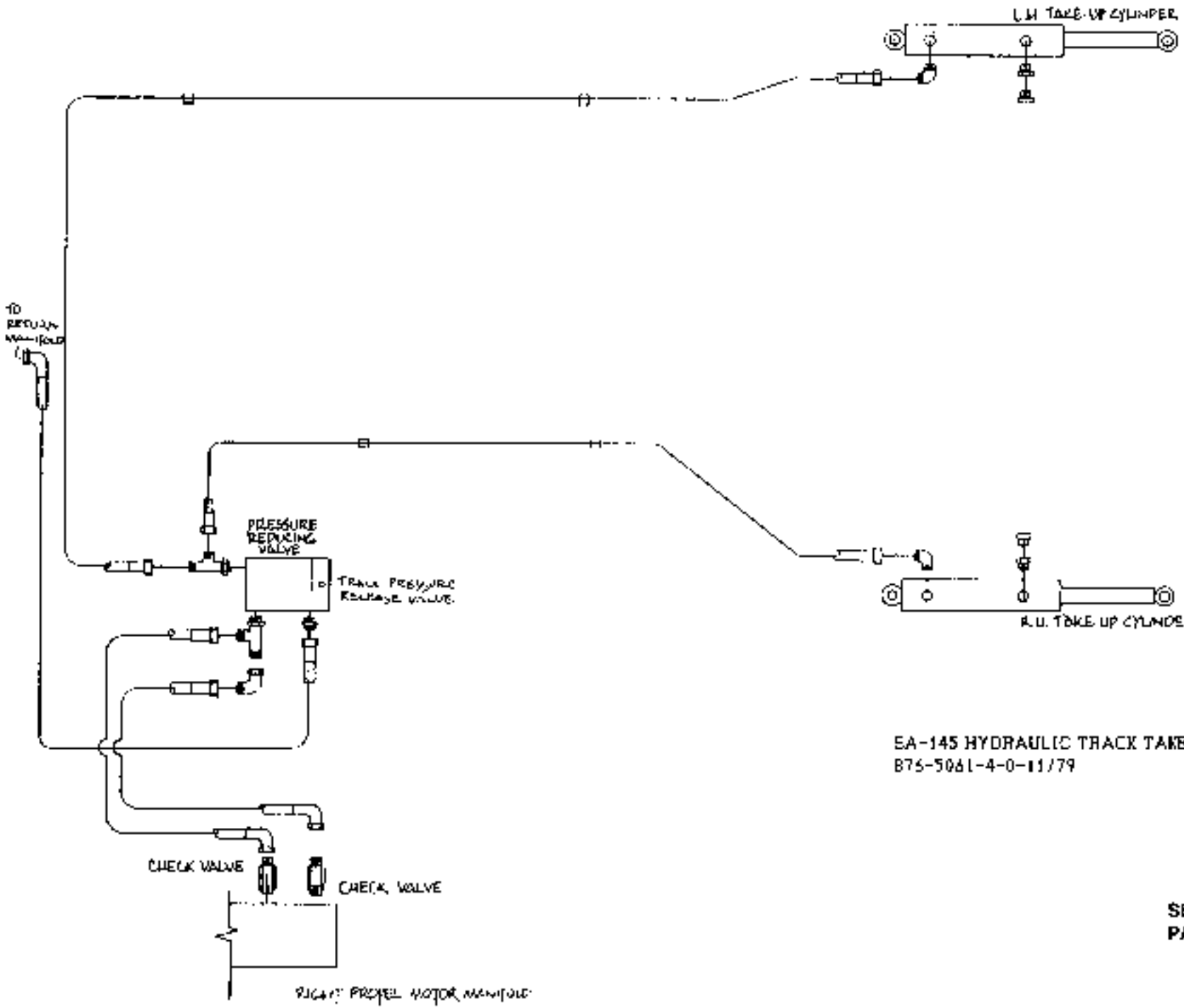
SA-145 HYDRAULIC SCHEMATIC
876-5009-0-3-6/81



SA-145 TRACTOR HYDRAULIC ASSEMBLY
876-5061-1-3-2/93

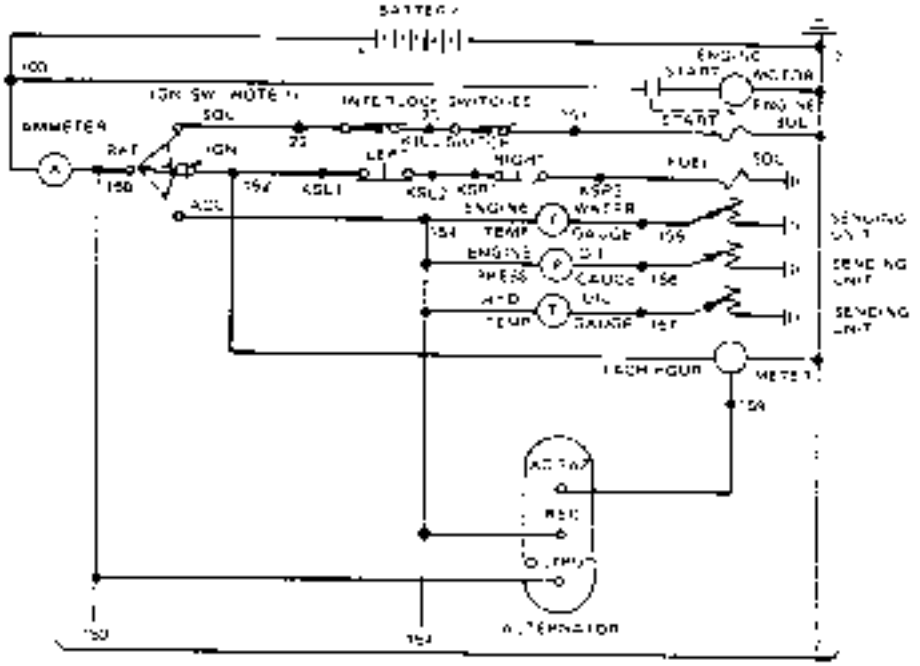


SA-145 AGC HYDRAULIC SCHEMATIC
575-5061-2-6-9/79

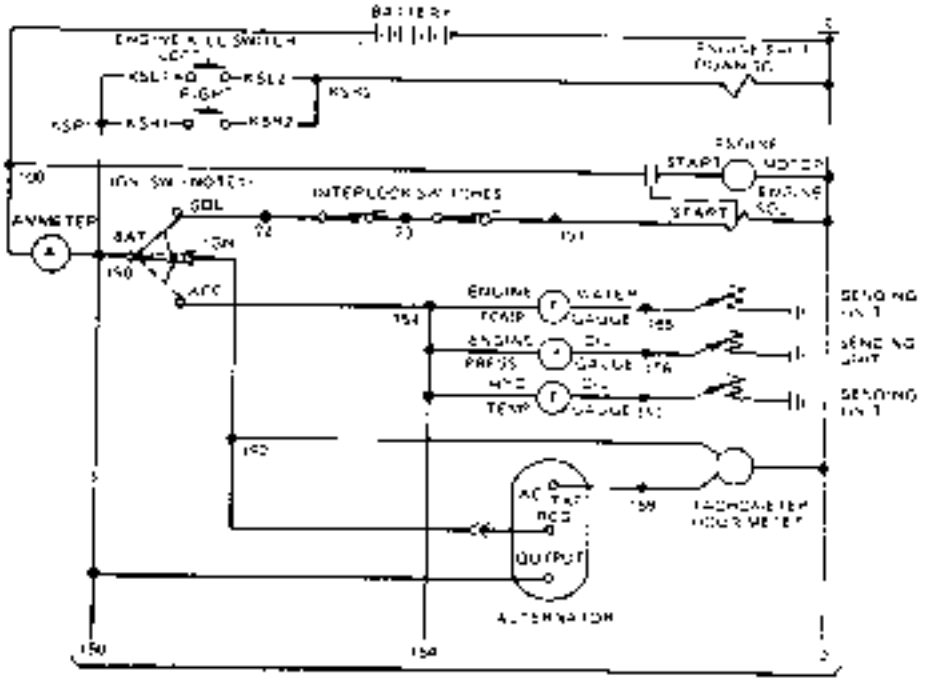


EA-145 HYDRAULIC TRACK TAKE-UP ASSEMBLY
B75-5061-4-0-11/79

INDEX



JOHN DEERE DIESEL NO. 4276T



GMC DIESEL NO. 453

FOR CONTINUATION SEE FIGURE I-2

FIGURE I-1 – Engine Schematic

CONTINUED FROM FIGURE I-1

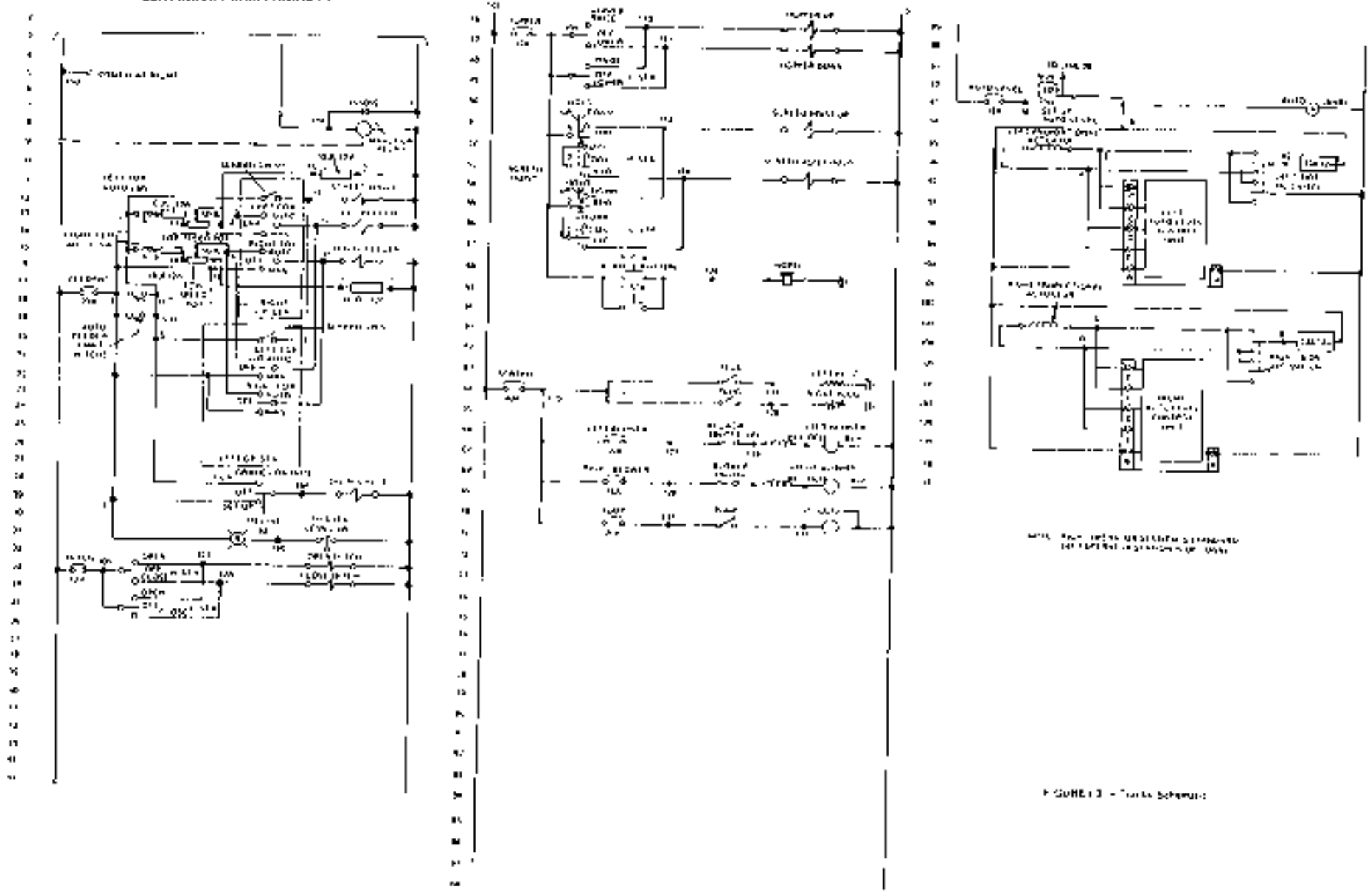
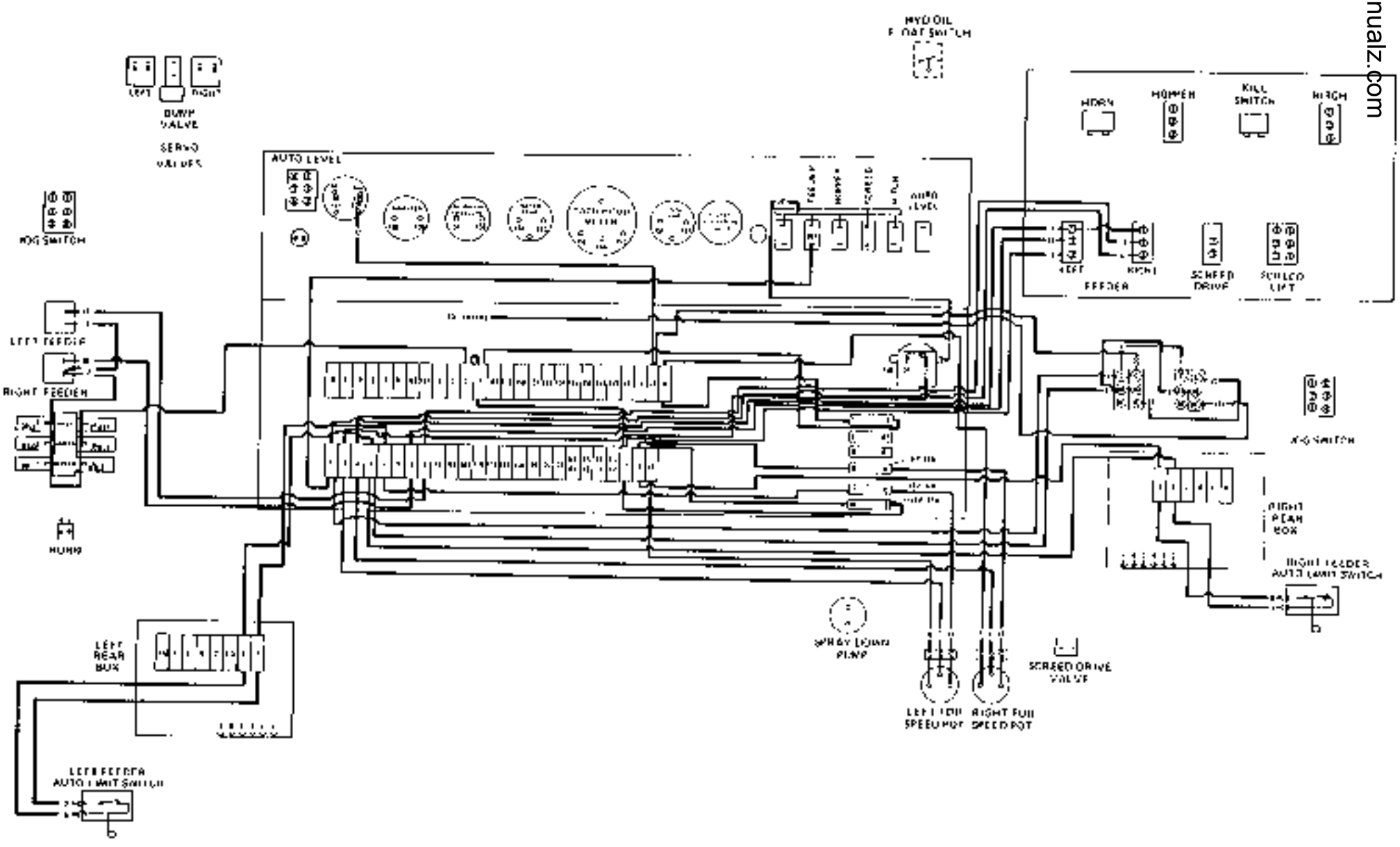
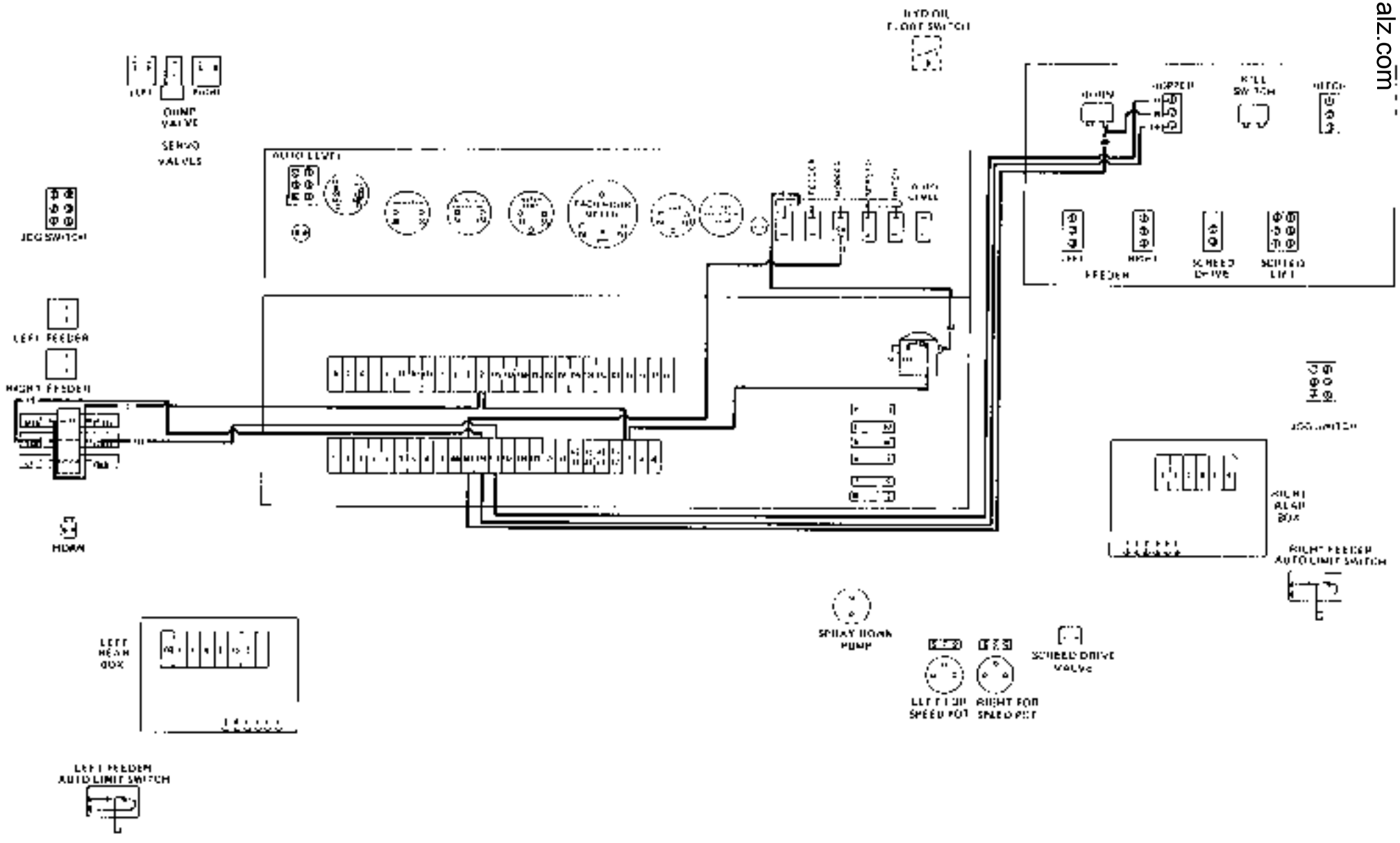
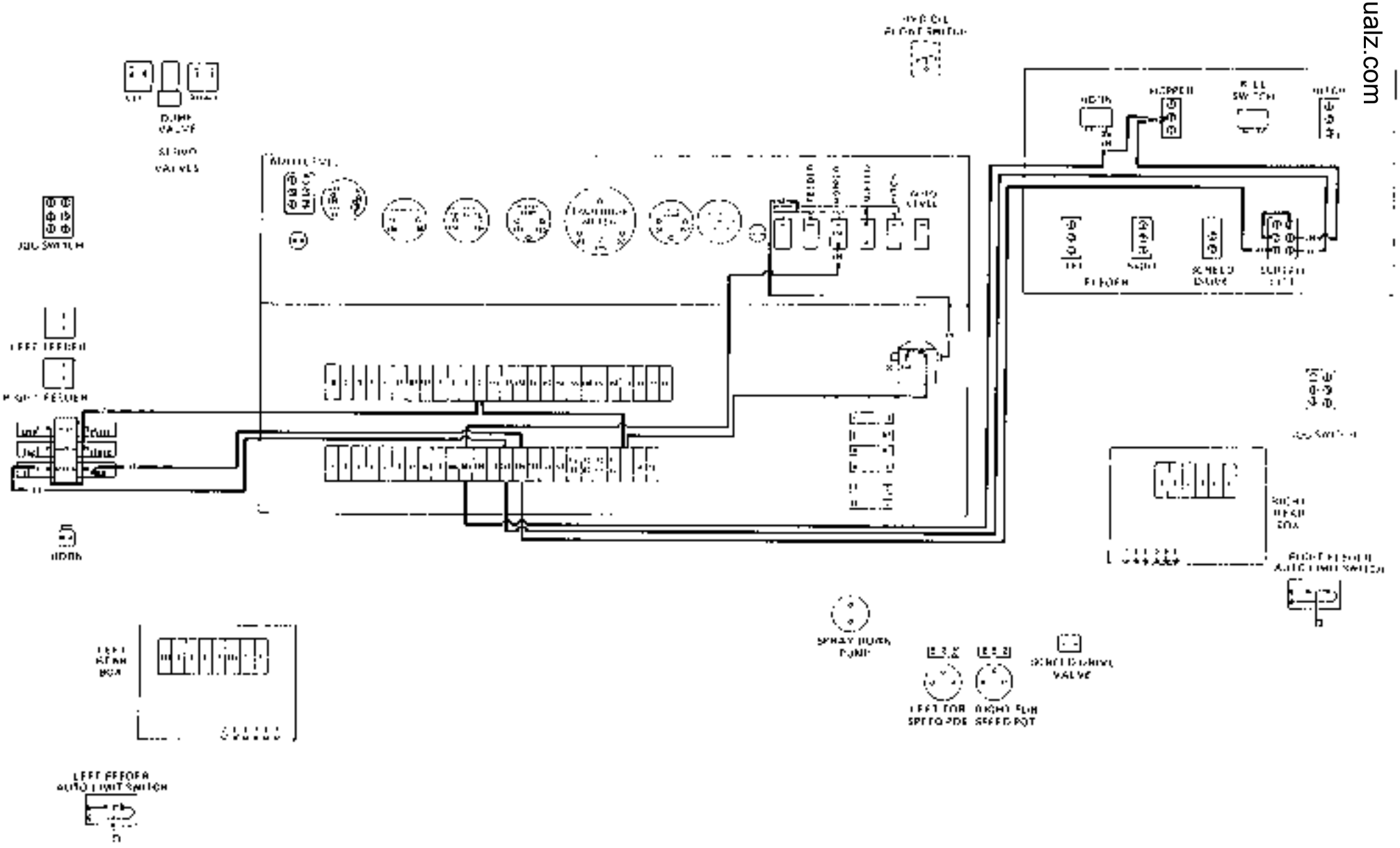
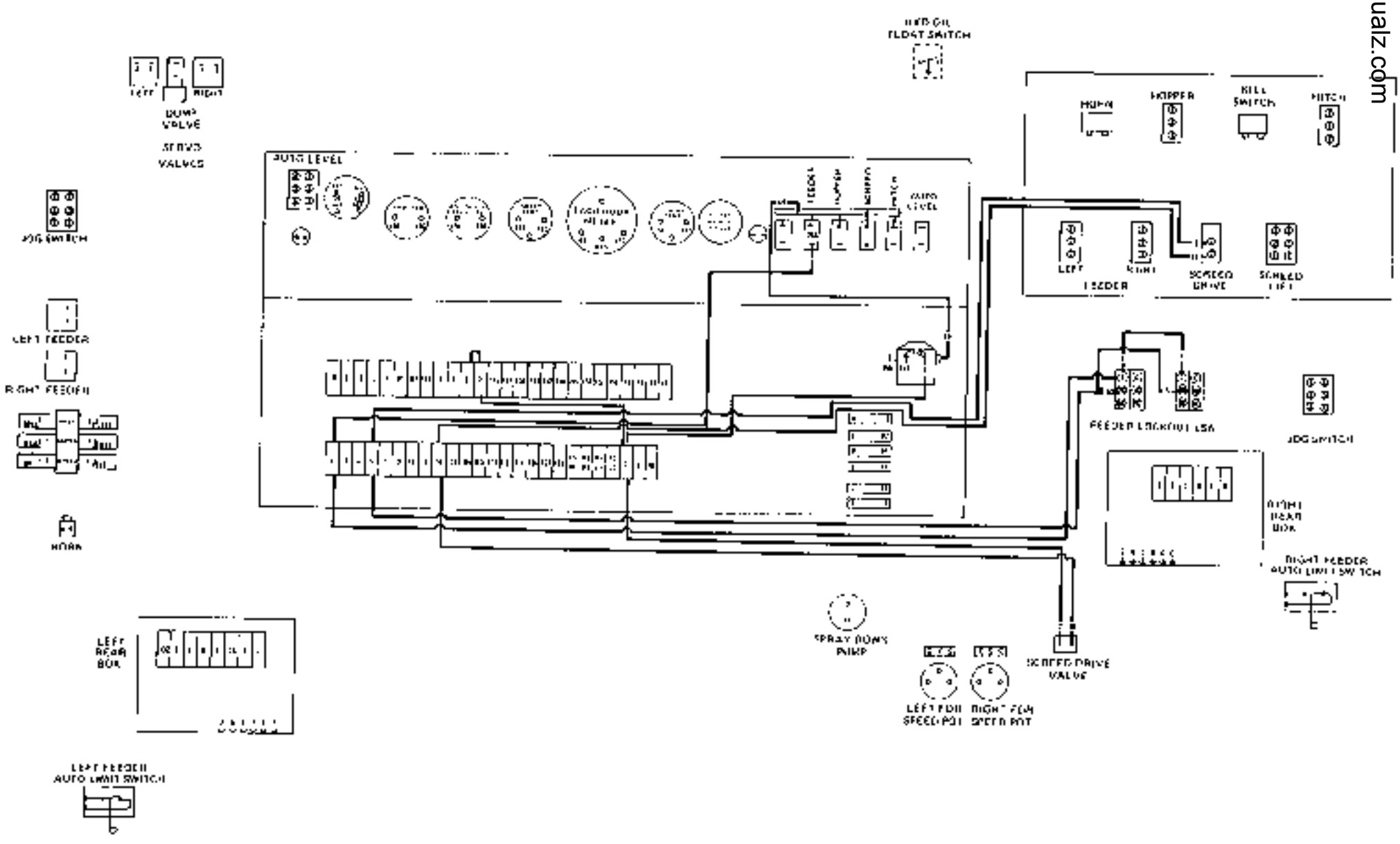


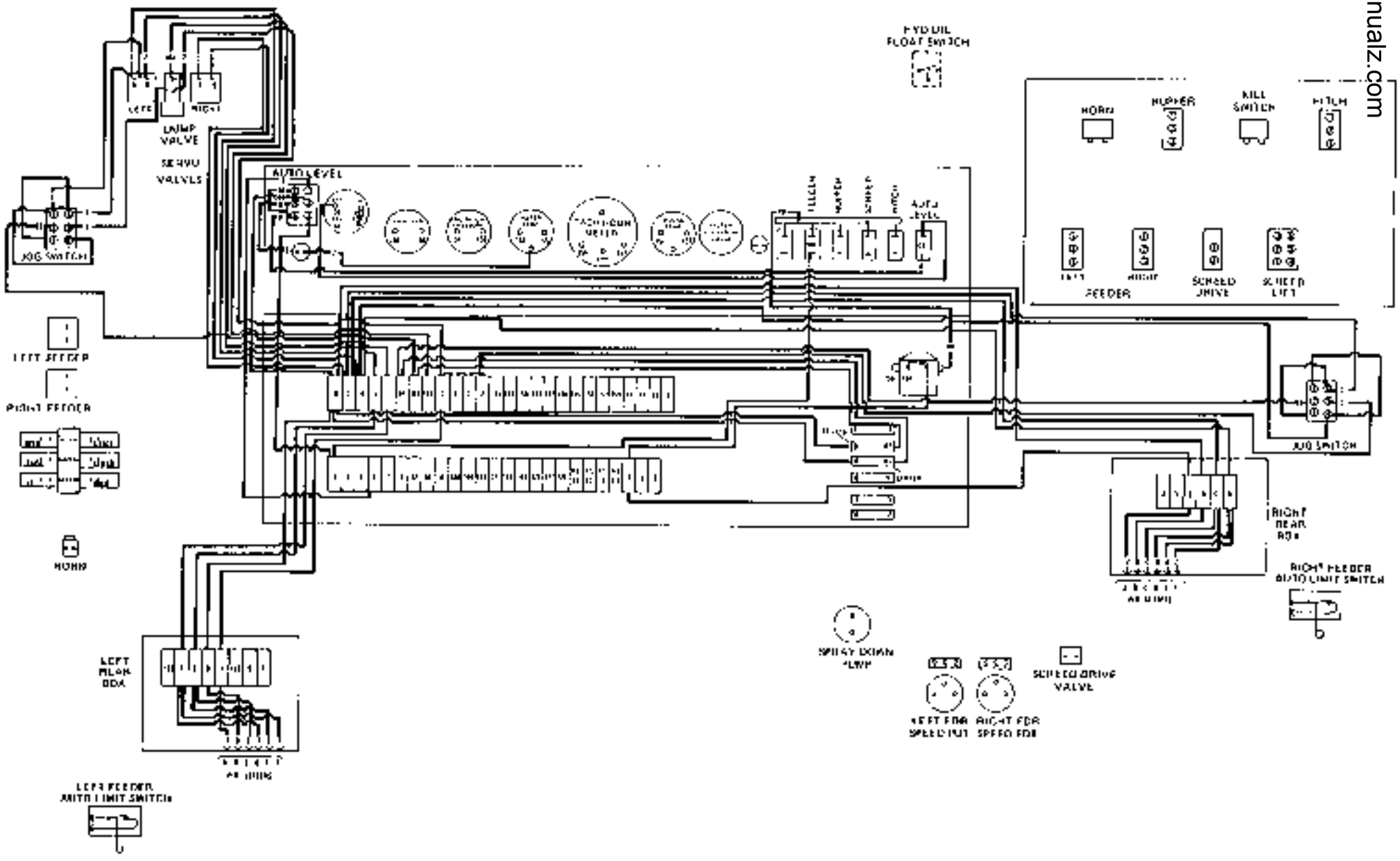
FIGURE I-2 - Finisher Schematic

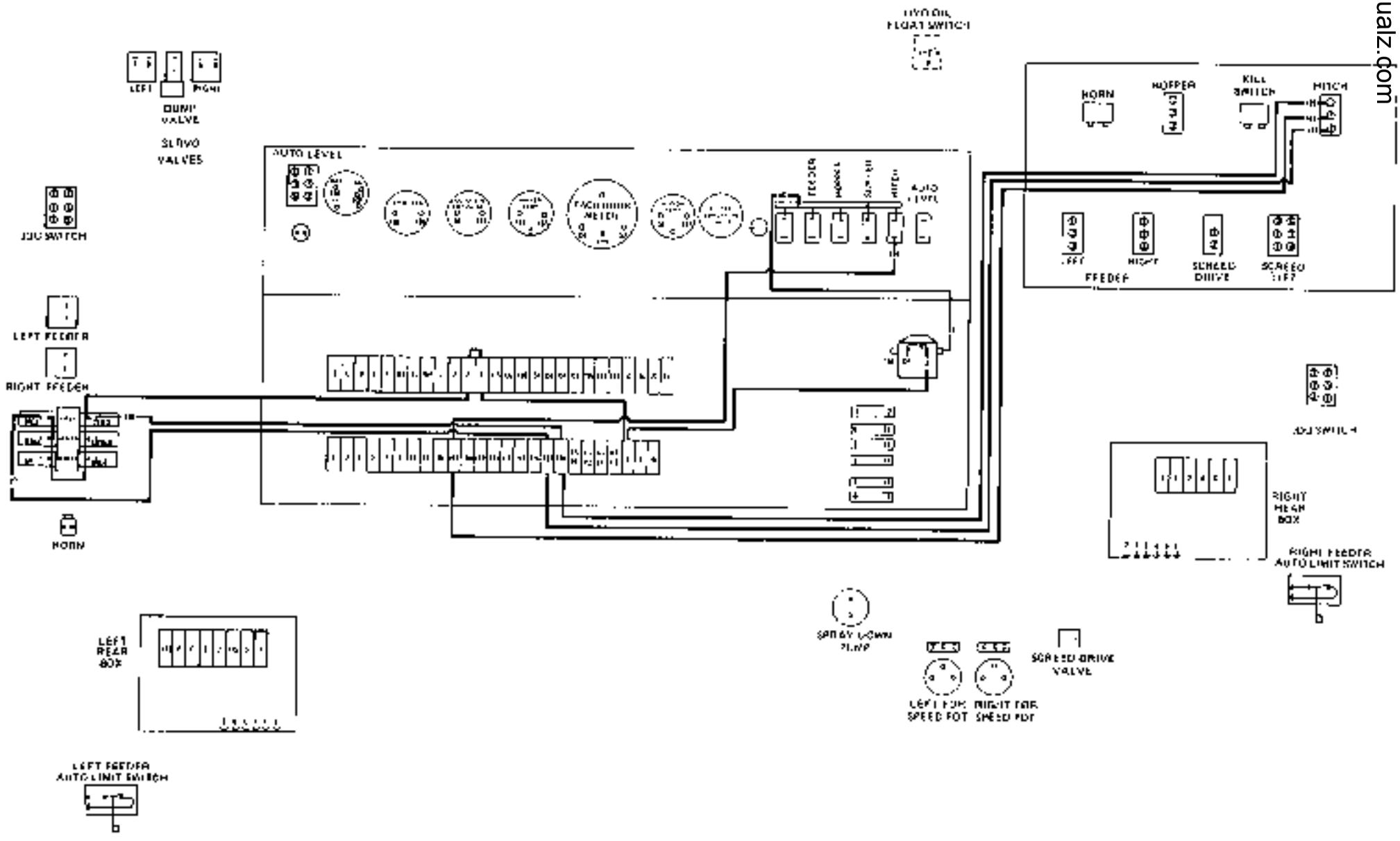












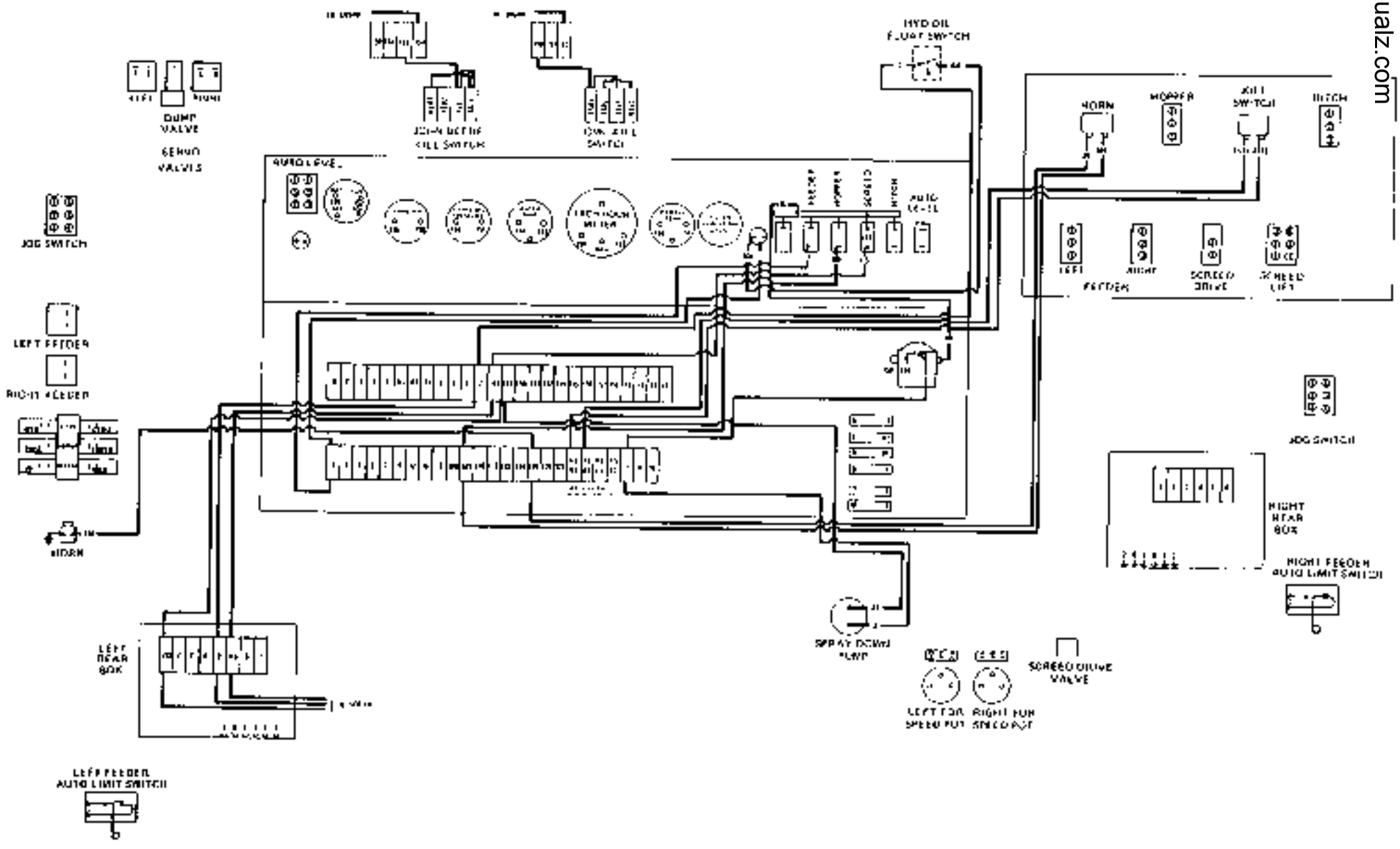
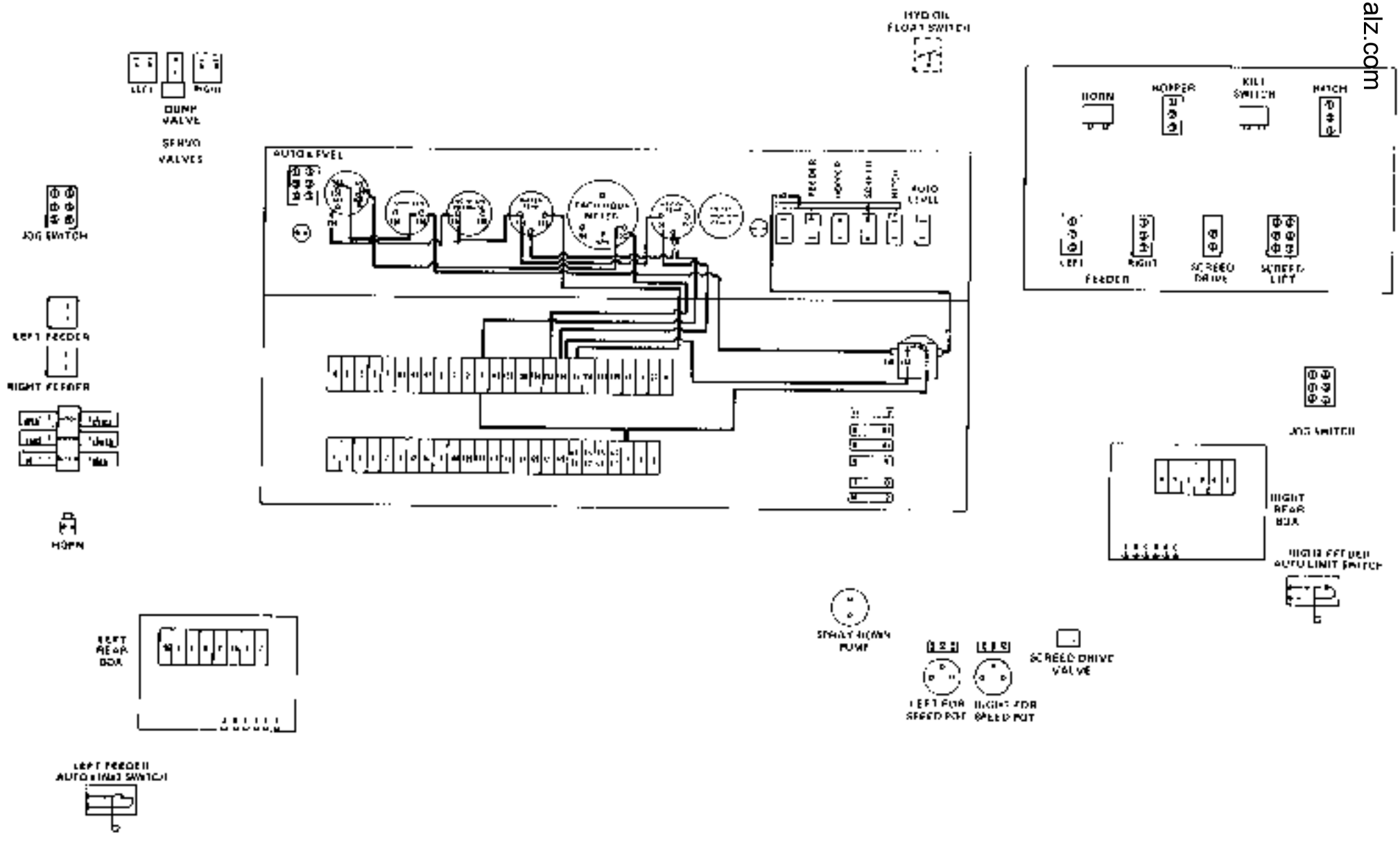


FIGURE 19 - [illegible]



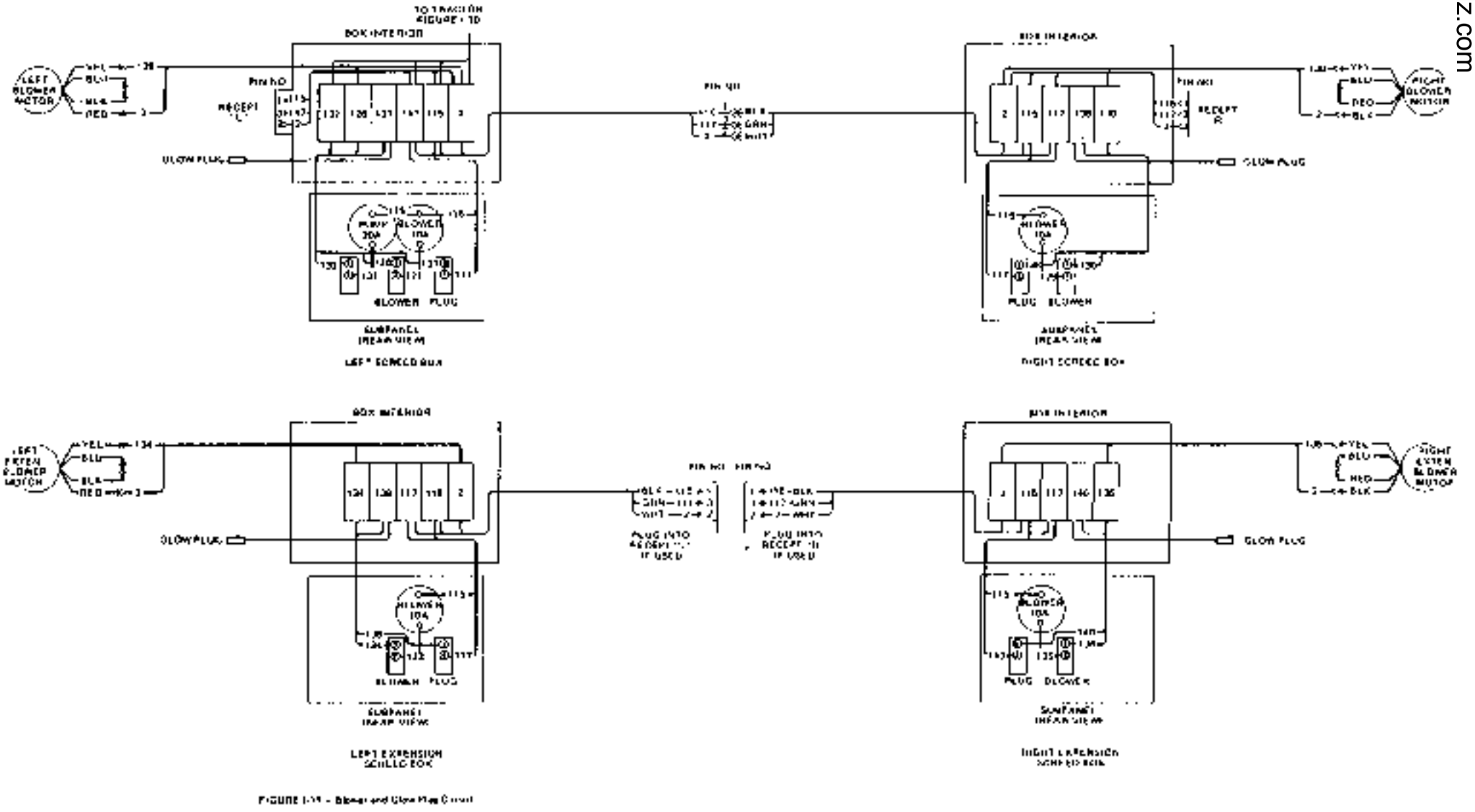
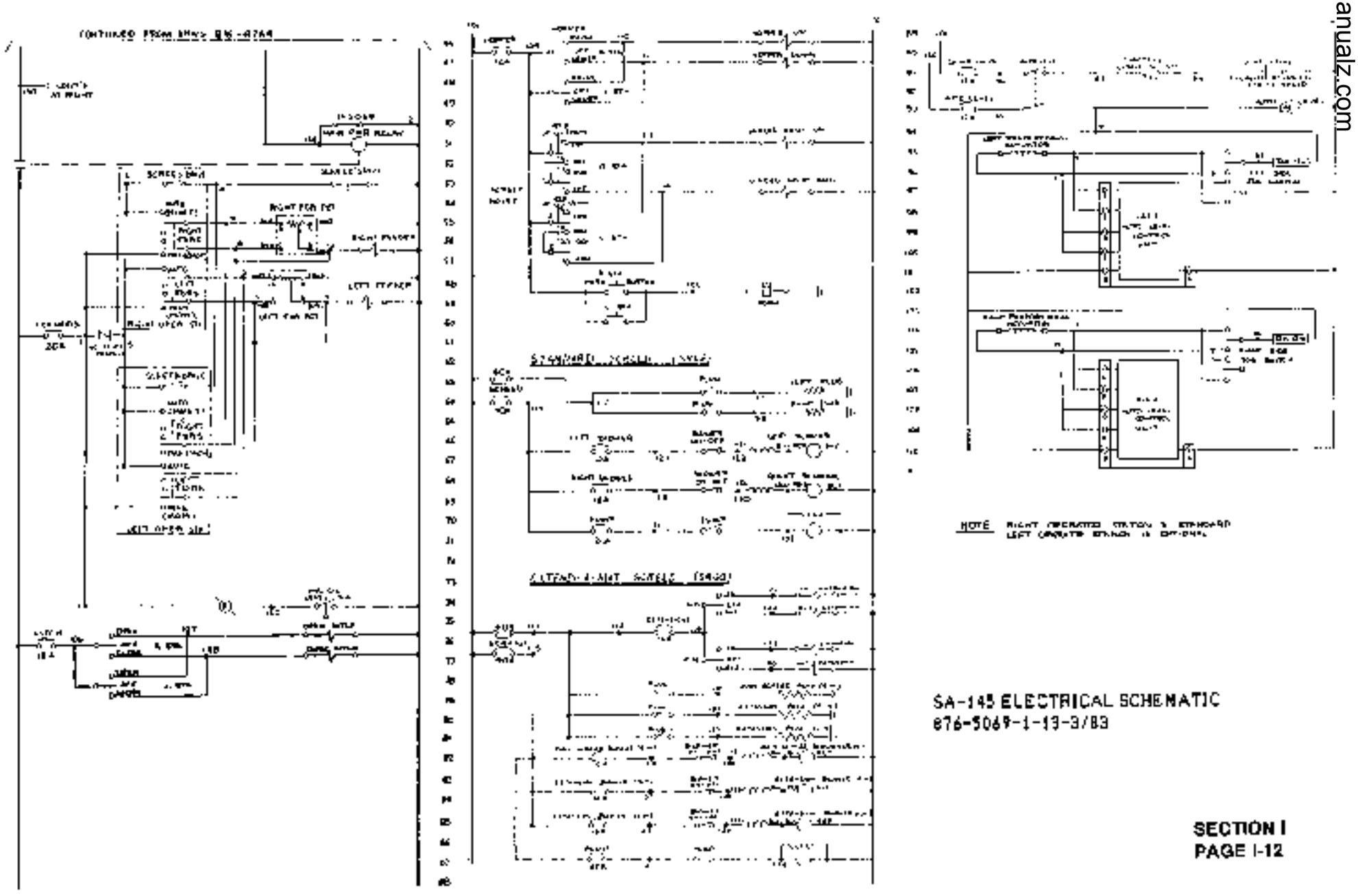
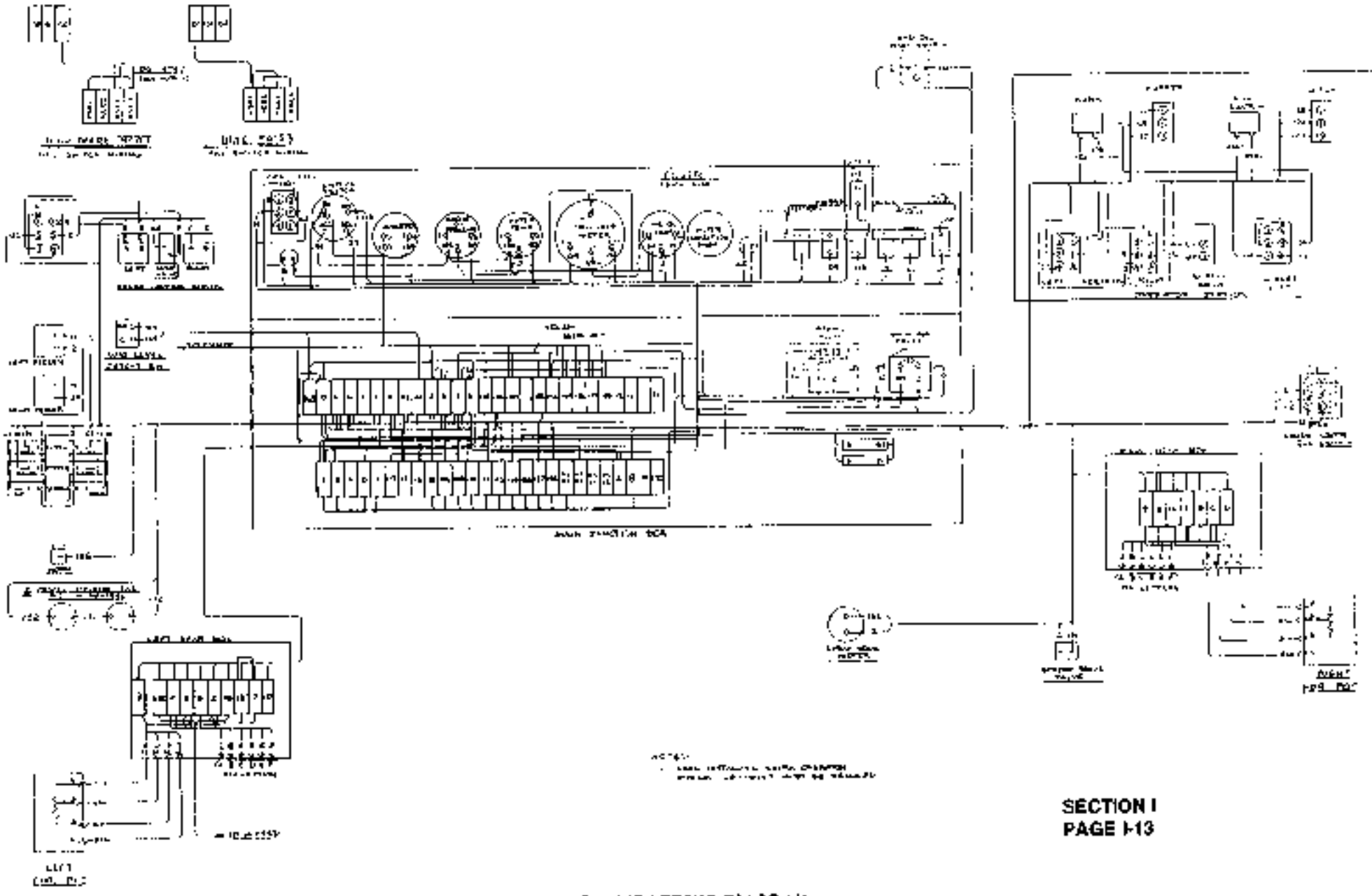


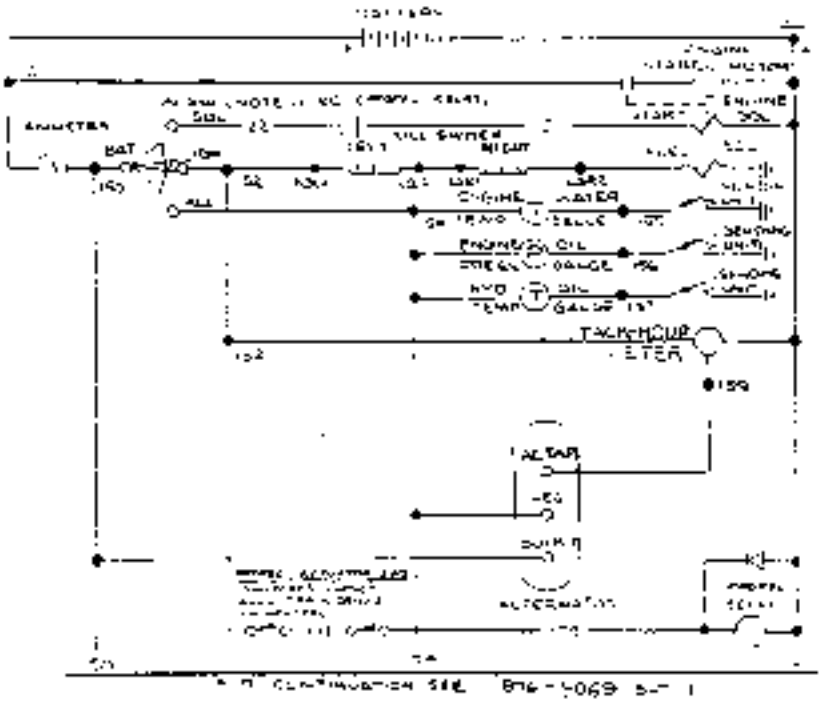
FIGURE 1-11 - Blower and Glow Plug Circuit



SA-145 ELECTRICAL SCHEMATIC
876-5069-1-13-3/83

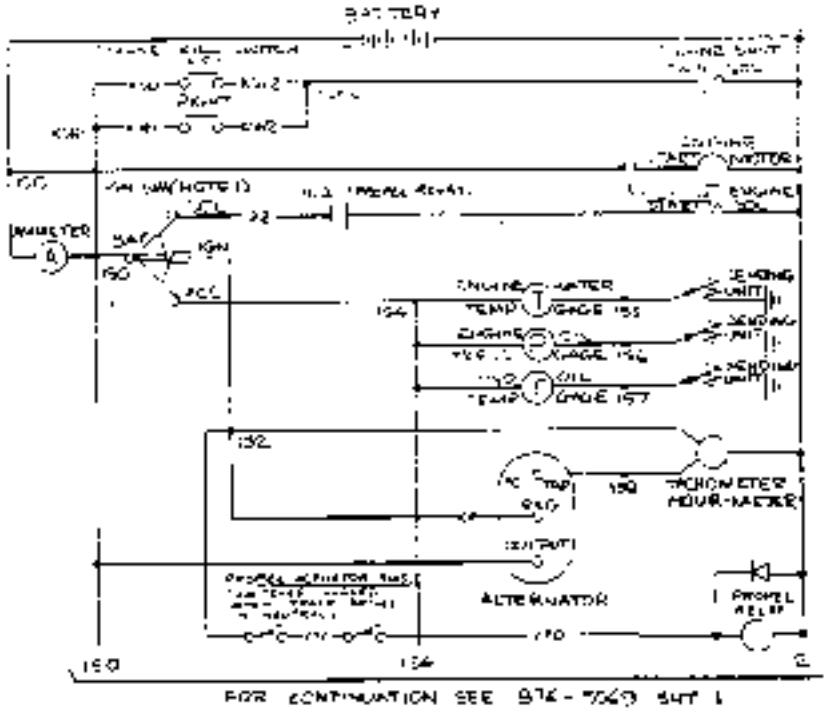


SA-145 WIRING DIAGRAM
876-5069-3-10 3/93



NOTE

THE IGNITION SWITCH IS SHOWN IN THE START POSITION, RUN POSITION IS SHOWN DOTTED



GMC DIESEL 4-92 & 3-53T

SA-145 ENGINE ELECTRICAL SCHEMATIC
876-5064-2-2-10/80

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J-1

DESCRIPTION OF HYDROSTATIC CIRCUITRY

INTRODUCTION:

The hydrostatic system is considered a closed loop system. It consists of a pump, a motor and the lines connecting them.

The system on the finisher are powered through a pump drive gear box which in turn is powered by the engine. The pump input shaft and cylinder block along with the charge pump are constantly rotating in one direction while the engine is running. The rotation of the cylinder block, the input and the charge pump shaft does not change at anytime during operation.

NEUTRAL (Refer to Figure J-1)

Oil flows through the hydraulic tank filters to a manifold which supplies oil to the charge pump. The charge pump is a small gear pump driven from the main pump shaft. The charge pump delivers 8 GPM of oil to the system. The purpose of the charge pump is to provide a flow of oil through the transmission for cooling purposes, to supply oil under pressure to maintain a positive pressure on the low pressure side of the circuit when in stroke, to provide sufficient oil under pressure for control purposes, and for internal leakage make up.

In the neutral position (Figure J-1) oil is introduced to the system by the charge pump through (2) check valves. From the charge check valves the oil is free to flow into the piston bores in the rotating pump cylinder block, out of the pump through ports A and C to the motor cylinder block and piston bores. Oil from the charge pump is also delivered to the displacement control valve where it deadheads and is only used when the system is in forward or reverse.

When the system is filled with low pressure static oil the excess oil delivered by the charge pump is pumped into the cooling system over the neutral charge relief valve located in the charge pump. This valve is set between 180 and 225 PSI. Port 3, for checking this pressure, is pointed out in Figure J-4, page J-1.2.

FORWARD (Refer to Figure J-2)

Control of direction and speed is accomplished by moving the control lever from the neutral position. On the finisher hydrostatic systems, this is accomplished electrically through the hydrotransmission valve.

The pump is provided with two opposing, single acting, spring loaded servo cylinders. (No. 1 and No. 2 on Figure J-2). The servo cylinders are spring loaded to the neutral position to insure positive neutral and are present in the system to move the swashplate and vary pump displacement.

In the case of forward movement of the spool electrically in the hydrotransmission valve allows pressurized oil from the charge pump to flow to servo cylinder No. 1. (See Figure J-2). The pressurizing of cylinder No. 1 while exhausting cylinder No. 2 will move the swashplate from the neutral position. The oil from servo cylinder No. 2 is directed to the hydrotransmission valve and pumped into the pump cooling system. When electrical current in the displacement control valve is cut off, the spool returns to the neutral position this trapping the oil in cylinders No. 1 and No. 2.

Oil from the charge pump is directed to the low pressure side of the main circuit by means of one of two check valves.

The tilting of the swashplate has changed the position of the pistons in the rotating cylinder drum and created a high pressure which holds the other check valve closed. Continuous rotation of the piston cylinder drum forces high pressure oil out of port "A" in the pump to port "B" in the motor cylinder drum which is connected to the motor output shaft. The pressurized pistons in the motor are forced against the fixed swashplate. The pressurized pistons inturn are forced to take the course of least resistance which is down hill on the fixed swashplate. When this takes place the cylinder drum and motor output shaft are rotated allowing other pistons to pick up high pressure oil and continue rotating the drum output shaft. The high pressure oil is carried to the low pressure side of the circuit and expelled out of motor port "D", to pump port "C" and recirculated back to the high pressure side of the circuit by the rotating pistons in the cylinder drum.

CHARGE CIRCUIT (FORWARD)

Oil from the high pressure side of the system is also directed to one side of the shuttle valve in the motor manifold. The high pressure oil moves the shuttle valve allowing excess oil delivered by the charge pump to return to the cooling system in the motor over the charge pressure relief valve. The charge pressure relief valve at the motor is set 10 to 15 PSI. lower than the neutral charge relief valve in the pump. In other words, if the charge pressure reading at the pump in neutral is 195 PSI, the charge pressure at the motor in stroke would be about 180 PSI. Charge pressure cannot be taken at the motor when system is in neutral because the shuttle valve is in the neutral position. The reason for the charge oil dumping at the motor instead of the pump while in stroke is to assure sufficient make up oil for the pump cylinder block due to internal leakage and oil lost to the control circuit.

HIGH PRESSURE RELIEF (FORWARD)

When the high pressure oil reaches pressures exceeding the presetting of high pressure relief valve No. 4, oil is dumped through relief valve No. 4 to the low pressure side of the system.

HYDRAULIC PRESSURE DATA

(All pressure to be taken after hydraulic oil has been warmed up 150° to 180°.)

	PRESSURE		BG No.
CRAWLER DRIVE			
Hi-Press. Relief at Motor	5000 psi	Sunstrand	
Charge Press.	* 180-220 psi	21 Series Pump	13521
Drain Press. at Motor	40 psi. Max.	21 Series Motor	13519
Vacumn at Pump	10" Hg Max.		
L.H. CONVEYOR			
Hi-Press. Relief at Motor	4000 psi	Sunstrand	
Charge Press.	* 180-220 psi	18 Series Pump	16W30
Drain Press. at Motor	40 psi Max.	18 Series Motor	16W36
Vacumn at Pump	5" Hg Max.		
R. H. CONVEYOR	SAME AS L.H		
SBS CONTROL			
Main Relief	2500 psi	Webster	16W32
SBS Relief	1700 psi Max.		
Grade Control Relief	600 psi		
Screed Drive Relief	1500 psi		

* 150 - 190 while pump is in stroke

REVERSE (Refer to Figure J-3)

The reverse circuit works just the opposite of the forward system.

SYSTEM OPERATING PRESSURE (Refer to Figure J-4)

The operating pressures may be read by attaching a high pressure gauge (7500 PSI) to Ports No. 1 and No. 2. Reading taken at Port No. 1 indicates the pressure monitored by right pressure relief valve "B". Reading taken at Port No. 2 indicates the pressure monitored by high pressure relief valve "A". 4000 PSI on feeder system, 5000 PSI on wheel drive system.

CHARGE PRESSURE (Refer to Figures J-4 and J-5)

Charge pressure may be read by attaching a gauge (400 PSI) to Port No. 3. This port, however, is blocked by the shuttle valve when the hydrostatic system is in neutral; therefore, the system must be operating either in the forward or reverse direction to obtain a pressure reading at this port.

NOTE: Ports No. 1, No. 2 and No. 3, depending upon the manifold valve assembly are tapped either for 1/8 N.P.T. or 7/16-20 straight thread. Any standard high pressure 1/8 pipe thread adapter fitting may be used in any or all of the three ports if they are 1/8 N.P.T. If the ports are tapped for 7/16-20 (Size No. 4) straight thread "O" ring adapter, one of the following adapters should be used.

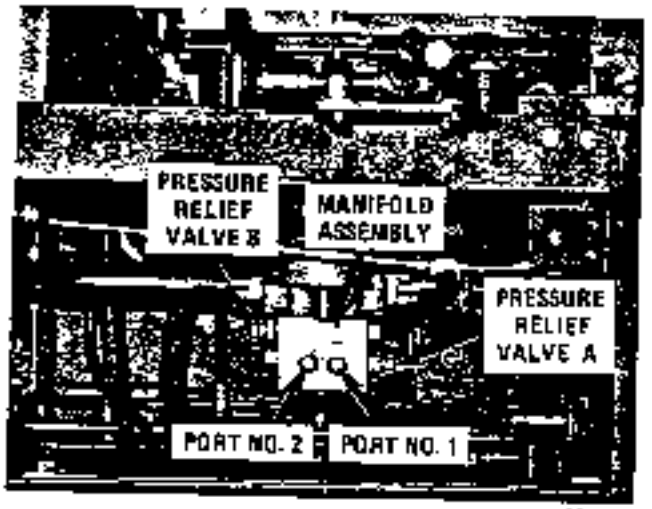
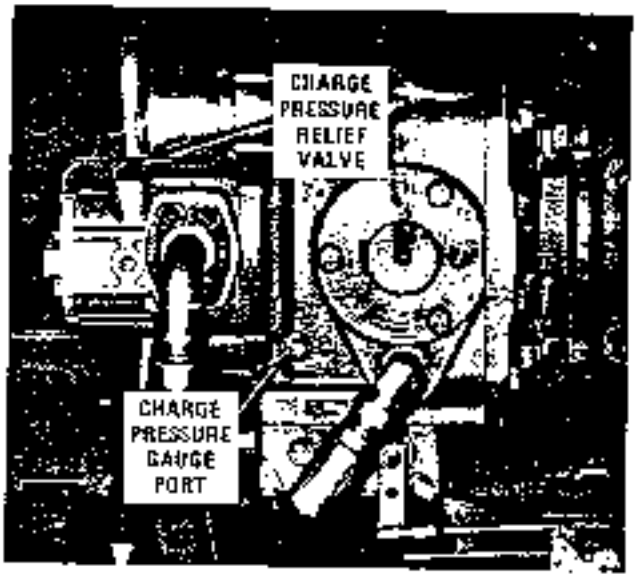


FIGURE J-4 Hydrostatic Motor

MANUFACTURER	STRAIGHT CONNECTOR	90° ELBOW
Parker	4FS BX-2	4CS BX-S
Aeroquip	202702-44	2062-4-4
Anchor	4BC + M383-4	4UCAY
Weatherhead	5315 X 4	5515 X 4
L & L	4-SA-2	4-SA-6
Flodar	OA 1000-4	OA-2000-4

The above fittings are "on the shelf" items and may be purchased from the manufacturer's local outlet, located by looking in the yellow pages under "Hose Couplings".

CHARGE PRESSURE may also be read by attaching gauge (600 PSI) to the charge pressure gauge port on pump (Refer to Figure J-5). This port will read charge pressure continuously whether the drum is turning or not. For satisfactory operation the minimum gauge reading should be 150 PSI to 190 PSI with pump in stroke.

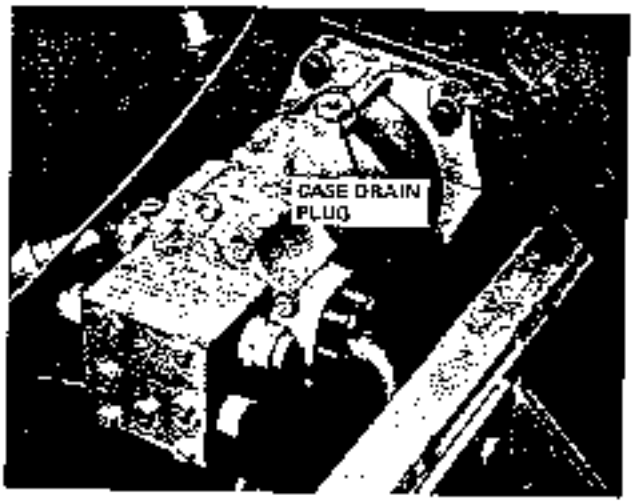


273679

FIGURE J-5 Hydrostatic Pump

FOR CHARGE PRESSURE GAUGE PORT ADAPTERS – SEE NOTE UNDER "MOTOR PRESSURE READINGS"

NOTE: Case pressure should be 40 PSI - Check at case drain plug on hydrostatic motor (Refer to Figure J-6).



270267

FIGURE J-6 Case Drain Plug

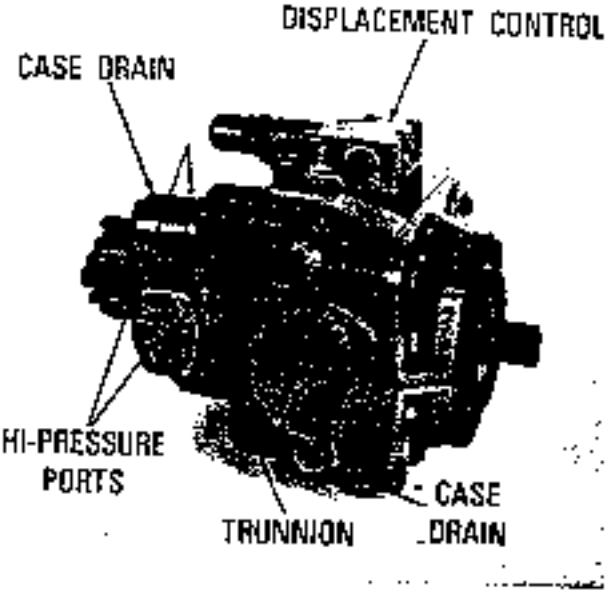


FIGURE J-7 – Variable Displacement Pump

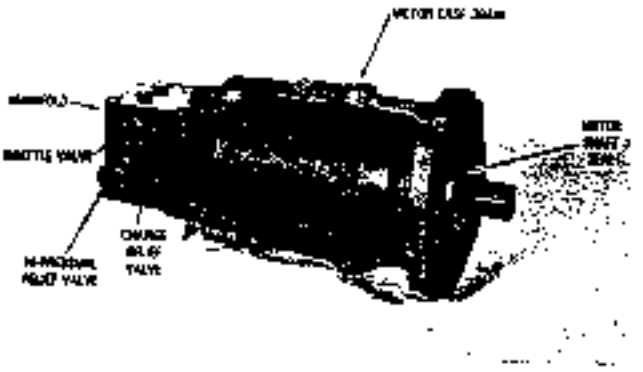


FIGURE J-8 – Fixed Displacement Motor

RECOMMENDED REPAIRS OF PUMP AND MOTOR IN THE FIELD

Certain repairs can be made by mechanics who use care not to damage new parts and use precautions to keep contamination out of system. For instance, the seals of the drive end of both pumps and motors are replaceable without much trouble.

On the pump – the charge pump, gasket, relief valve and check valves are easily replaced.

On the motor – the entire relief valve manifold can be replaced. The high pressure relief valves, low pressure relief valve and shuttle valve are easily replaceable.

The above repairs can be made without affecting the pump or motor warranty, and are described in "replacement of major assemblies". (See below).

A complete overhaul of both pumps and motors can be made only by factory approved and trained servicemen. CUSTOMERS ARE CAUTIONED AGAINST ATTEMPTING AN OVERHAUL OF A HYDROSTATIC PUMP OR MOTOR AS THIS WILL VOID THE WARRANTY.

The following paragraphs are provided for background information only and should not be construed to mean that Barber-Greene recommends field overhaul of equipment by customer. Except for the minor repairs specified in "Major Assembly Replacement Section", we strongly recommend the complete replacement of defective pumps and motors.

REPLACEMENT OF MAJOR ASSEMBLIES INTRODUCTION

Should it become necessary to replace a part of the hydrostatic transmission, the following procedure will help.

As with all hydraulic equipment, cleanliness is very important. Before removing any of the components, clean the immediate area to prevent dirt from getting into the system. While working on the transmission, it would be a good opportunity to inspect all hoses and fittings for tightness, change the filters and oil, if necessary, and replace any oil lost during servicing.

REPLACEMENT OF MAIN PUMP

REMOVAL (Refer to Figure J-9)

1. Disconnect wires to Hydrotransmission Valve.
2. Loosen hydraulic tank cap to relieve any system pressure.
3. Place drain pan or bucket under the pump.
4. Remove the five hoses. Place clean plastic plugs in the lines and pump ports to prevent oil loss as each line is removed. (Do not use rags)
5. Remove the four mounting bolts.
6. Place a sling around or use eye bolt in the trunnion, remove pump from machine.

INSTALLATION (Refer to Figure J-10)

1. Mount pump on machine using the four mounting bolts.
2. Remove all shipping plugs as lines are installed. See Figure J-1 for correct line installation. Be sure lines are tight.

NOTE: It is recommended the pump case be filled by hand (Figure J-10) to assure proper lubrication upon start-up.

3. Install wires to hydrotransmission valve. Refer to proper wiring diagram.

REPLACEMENT OF MOTOR

REMOVAL (Refer to Figure J-11)

1. Loosen hydraulic tank cap to relieve any system pressure.

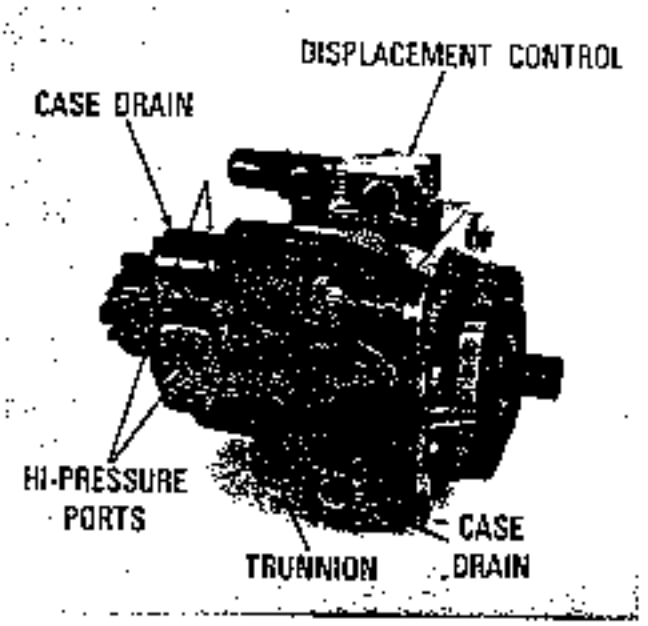


FIGURE J-9 – Pump

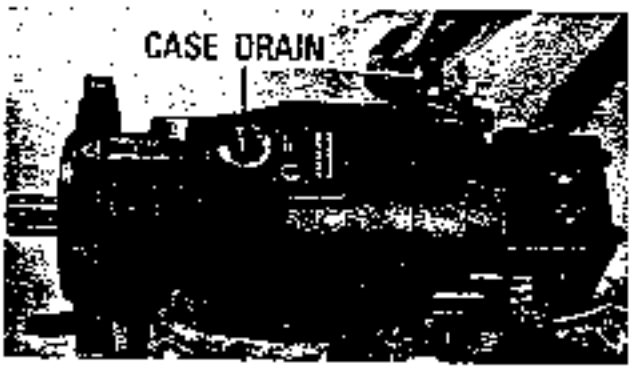


FIGURE J-11 – Motor

2. Place drain pan or bucket under the motor
3. Remove the three hoses. Place clean plastic plugs in lines and plug motor ports to prevent draining entire system as each hose is removed. (Do not use rags).
4. Remove the four mounting bolts.
5. Place a sling or similar support around motor and remove from machine

INSTALLATION (Refer to Figure J-12)

1. Mount motor on machine using the four mounting bolts.
2. Remove all shipping plugs as lines are installed. See Figure J-1 for correct line installation. Be certain lines are tight.

NOTE: It is recommended that the motor case be filled by hand to assure proper lubrication upon start-up. (Refer to Figure J-12)

REPLACEMENT OF CHARGE PUMP

REMOVAL (Refer to Figures J-13 & J-14)

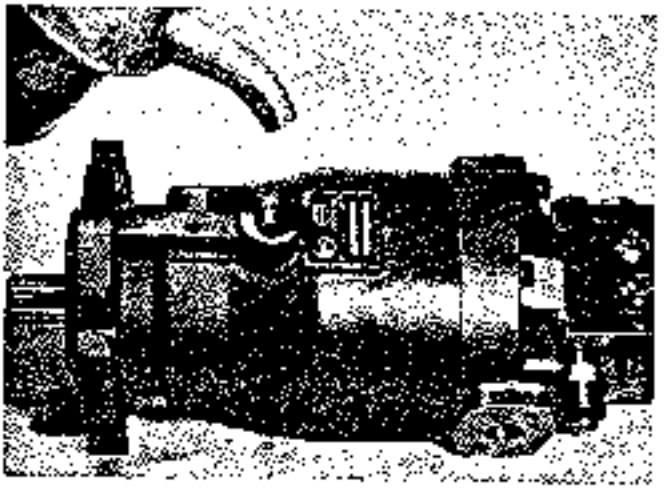
1. Wash all dirt from pump.
2. Disconnect the suction hose from charge pump at the charge pump. Raise the loose end as high as possible to minimize loss of oil and plug.
3. Disconnect the pump case drain hose (not the large high pressure hose) which runs between the pump and the manifold, at the pump. Raise the loose end as high as possible to minimize the loss of oil and plug.
4. Remove two 1/4-20 hex head cap screws from each side of the charge pump. Do not loosen the two screws located one at the top and one at the bottom. These two screws are used to hold the charge pump together and do not screw into the end cap.
5. Remove the charge pump assembly.

NOTE: Do not use sharp tools to pry charge pump from main pump. A scratch on the sealing surfaces may cause a leak. If charge pump does not pull loose, tap lightly on side of charge pump with plastic hammer to break paint or gasket seal. The assembly is located by a spread pin. It will, therefore, be necessary to overcome the friction of this pin when removing the charge pump.

NOTE: Note position of tang on charge pump shaft. If the shaft is then turned, it can be returned to its original position, making reassembly of the tang into the slot of the main pump drive shaft much easier.

INSTALLATION (Refer to Figures J-14, 15 and 16)

1. Replace charge pump gasket. If the gasket is damaged in any way, it should be replaced.



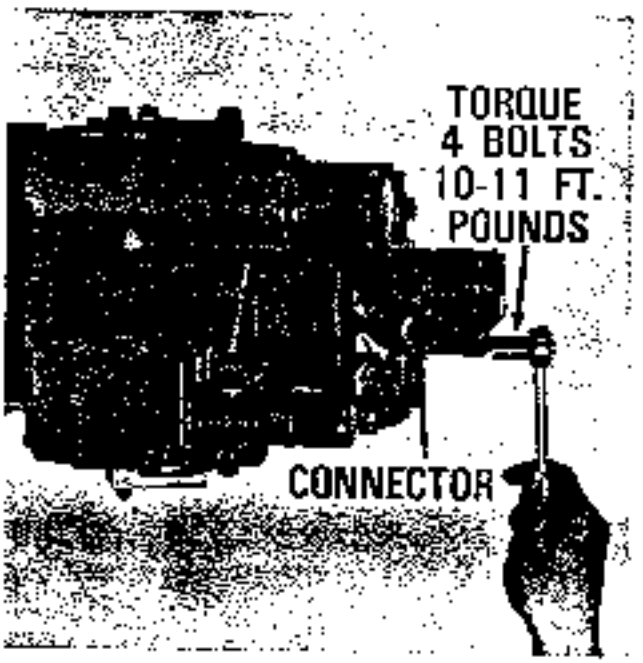


FIGURE J-13 – Charge Pump

FIGURE J-14 – Charge Pump

NOTE: It is extremely important to install the gasket correctly. Make sure all ports in the pump are open and not covered by a portion of the gasket.

2. Replace charge pump. Slip body onto the spread pin and tighten the four bolts. Torque the bolts to 10-11 ft. lbs. Overtightening will crack the aluminum case or section of charge pump.

NOTE: The tang of the charge pump drive shaft must be aligned with, and engaged into, the corresponding slot in the main drive shaft.

3. Reconnect hoses.
4. Replace lost oil.
5. Start the Finisher engine at a low idle for approximately two minutes. Check oil level in hydraulic tank. Add or remove oil to attain the desired oil level.

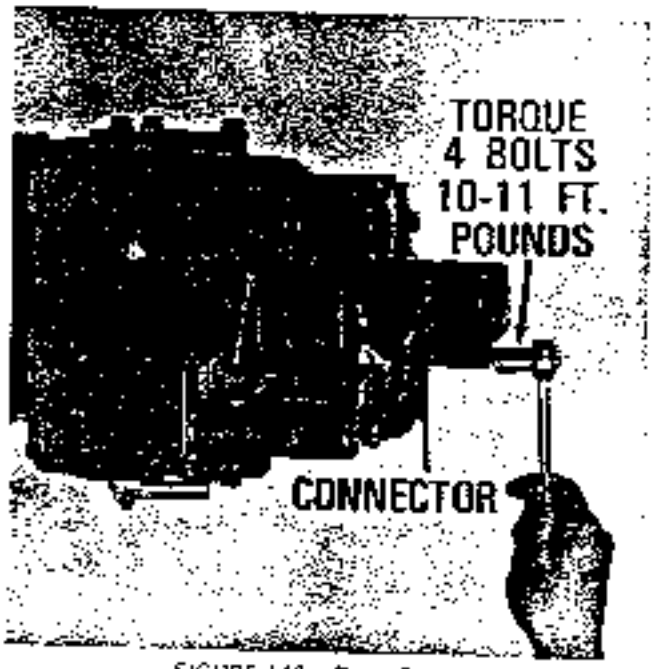


FIGURE J-16 – Charge Pump

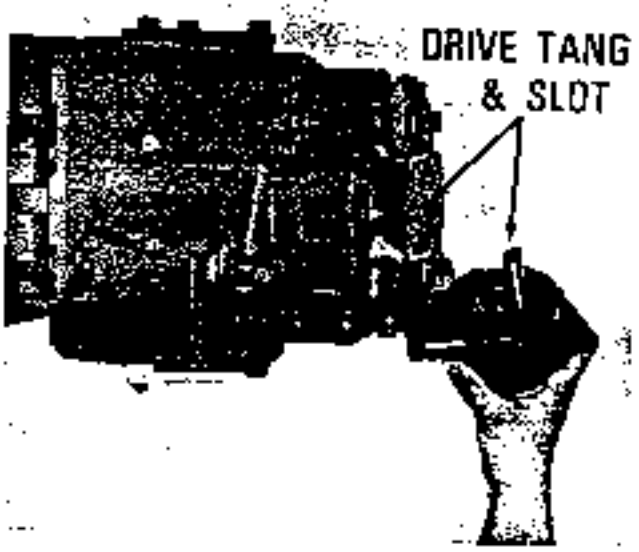


FIGURE J-15 – Charge Pump

FIGURE J-17 – Check Valves

FIGURE J-18 – Check Valves

REPLACEMENT OF CHECK VALVES

REMOVAL (Refer to Figure J-17, 18 and 19)

1. Remove charge pump as outlined above.
2. Remove two check valves. This can be done with a wide blade screwdriver or flat piece of metal approximately 3/32 inches thick by 5/8 inches wide, used as a screwdriver. (Turn CCW)

NOTE: It is advisable to replace both check valves when servicing.

INSTALLATION (Refer to Figure J-18 and 19)

1. Prior to installation, inspect "O" rings for damage. Coat the "O" rings with light grease to prevent their being damaged as the valve is screwed into place. Make sure valves are screwed down tight. On 20 through 23 series

FIGURE J-19 – Check Valve

pumps, torque check valves to 30-40 ft. lbs. On 24 through 27 series pumps, torque check valves 30-40 ft. lbs.

NOTE: The check valves must be below the face of the end cap.

REPLACEMENT OF MANIFOLD

REMOVAL (Refer to Figure J-20)

1. Prior to removal of manifold assembly, remove all dirt and clean area where manifold assembly is attached to end cap.
2. Place drain pan under manifold to catch oil.
3. Remove the four bolts holding manifold to motor end cap.
4. Grasp manifold to prevent it from dropping and remove remaining two mounting bolts. There is no gasket between the manifold and end cap. Sealing is obtained by "O" rings and back up rings.

INSTALLATION (Refer to Figure J-21 and 22)

1. Use new "O" rings and back up rings.
2. The two grooves, side by side, require an "O" ring and back up ring. The "O" ring goes into the groove first, then install the back up ring on top of the "O" ring. The flat side of the back up ring faces away from the "O" ring.
3. The remaining groove requires only an "O" ring.
4. Place manifold against motor end cap. Install bolts being certain "O" rings did not slip from the grooves. Torque bolts 19-21 ft. lbs.
5. Check hydraulic tank for oil level.

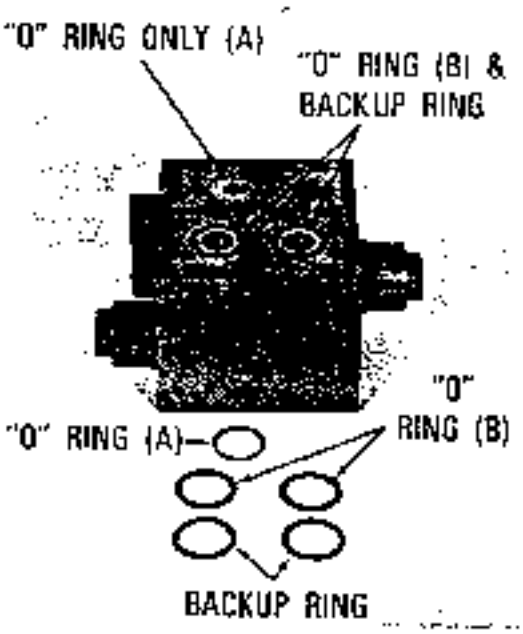


FIGURE J-22 - Manifold

REPLACEMENT OF HIGH PRESSURE RELIEF VALVES

REMOVAL (Refer to Figure J-23)

1. Apply a wrench on hex portion of valve and unscrew from manifold block.

NOTE: There are two relief valves in manifold block.

INSTALLATION (Refer to Figure J-24)

1. Prior to installation inspect "O" rings and back up rings for damage.
2. Apply a lubricant to the "O" ring and install in manifold.
3. Torque to 20 ft. lbs.

FIGURE J-20 – Manifold

FIGURE J-21 – Manifold

FIGURE J-23 - Relief Valve

REPLACEMENT OF MOTOR OR PUMP SEAL

REMOVAL (Refer to Figures J-24 thru J-32)

1. Remove unit from Finisher.
2. Insert Tru Arc No. 7 pliers in snap ring holes, compress ring and roll out. (Refer to Figure J-24)
3. Remove aluminum seal retainer with screwdriver. (Refer to Figure J-25)
4. Remove steel stationary seal (This generally comes out with retainer) (Refer to Figure J-25)
5. With fingers or two screwdrivers remove bronze rotating part of seal from drive shaft. (Refer to Figure J-25)
6. See Figure F-26 and account for all the parts shown.

FIGURE J-24 – Pump Shaft Seal

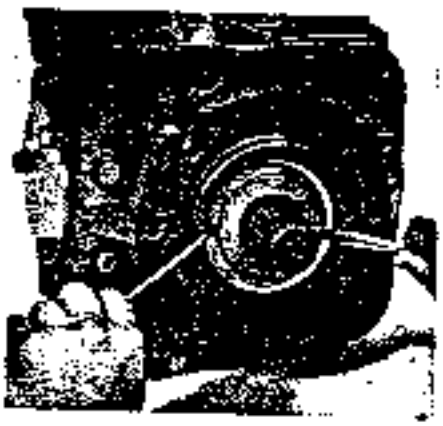


FIGURE J-25 – Pump Shaft Seal

INSTALLATION (Refer to Figure J-24 thru J-32)

1. Wash, clean and air dry new seal parts.

FIGURE J-26 – Pump Shaft Seal

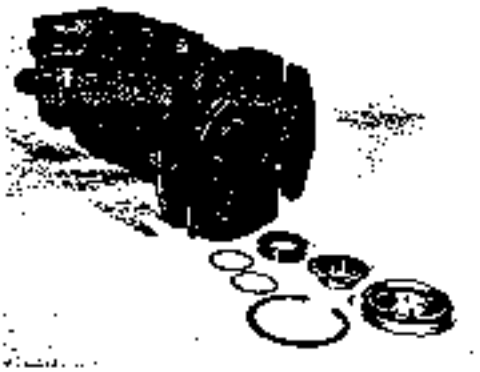


FIGURE J-27 – Motor Drive Shaft

FIGURE J-28

NOTE. Always replace both stationary and rotating parts of seal. Do not mix old and new parts.

2. Install the seal springs into aluminum seal retainer. Install new "O" rings dry on stationary steel part of seal and place seal into retainer so notch is located in pin in retainer. (Refer to Figure J-29)
3. Install large "O" ring on O.D. of retainer. (Refer to Figure J-29)

FIGURE J-29

4. Install new "O" ring in I.D. of bronze rotating part of seal. (Refer to Figure J-28)
5. Wrap piece of plastic around drive shaft and slide rotating bronze part over shaft making sure it is seated do not press on seal surface. (Refer to Figure J-30)

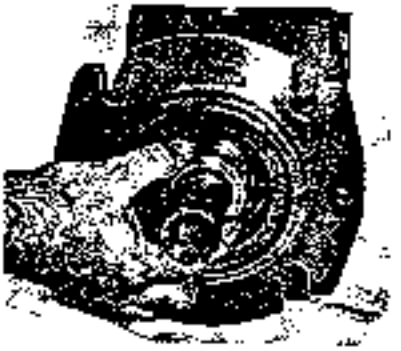


FIGURE J-30

6. Install stationary seal and retainer into place and press retainer in so snap ring groove is open. (Refer to Figure J-31)

FIGURE J-31

7. Close snap ring pliers. Install snap ring with tapered edge out.
8. For ease of installation start snap ring in groove with side opposite snap ring holes. (Refer to Figure J-32)

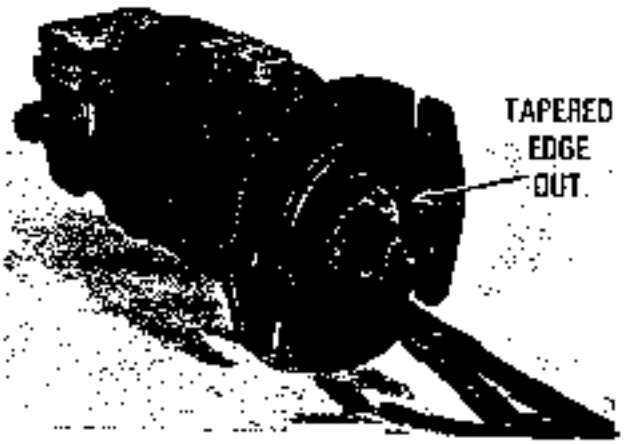


FIGURE J-32

REPLACEMENT OF DISPLACEMENT CONTROL VALVE

REMOVAL

1. Remove control linkage from Displacement Control Valve Assembly.
2. Remove the nine (9) capscrews holding valve to pump housing. See Figure J-33.
3. Lift valve away from housing and remove cotter pin and washer. See Figure J-34. Remove pin from link in pump.

NOTE: Caution must be exercised to prevent these parts from falling into pump.

4. Remove orifice and "O" ring from control valve, see Figure J-35.

FIGURE J-33

FIGURE J-34

INSTALLATION

1. Install orifice, tip down, and new "O" ring in Control Valve.
2. Install new gasket on control valve dry.
3. Install pin in control valve links and pump link.
4. Place washer on pin, install cotter pin and spread.

NOTE: Caution should be exercised during installation of these parts to prevent them falling into unit. Lightly coating parts with petroleum jelly (not grease) is advised.

5. Install valve to pump and torque the nine (9) bolts 10 11 ft. lbs.

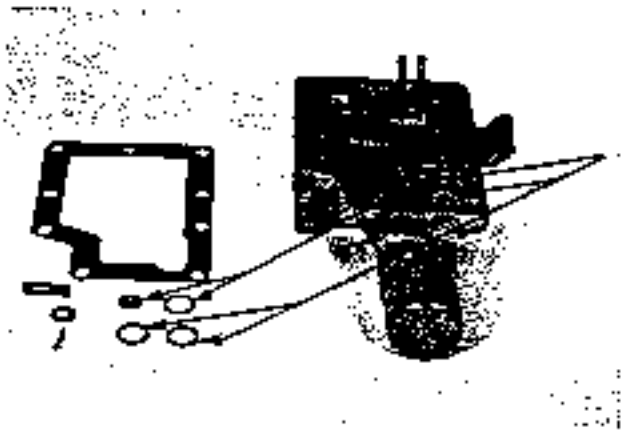
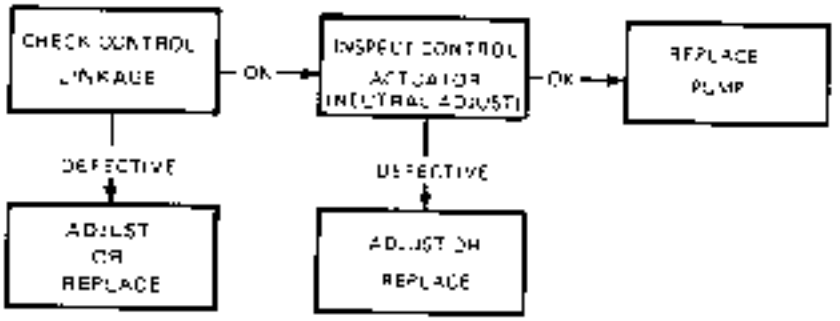


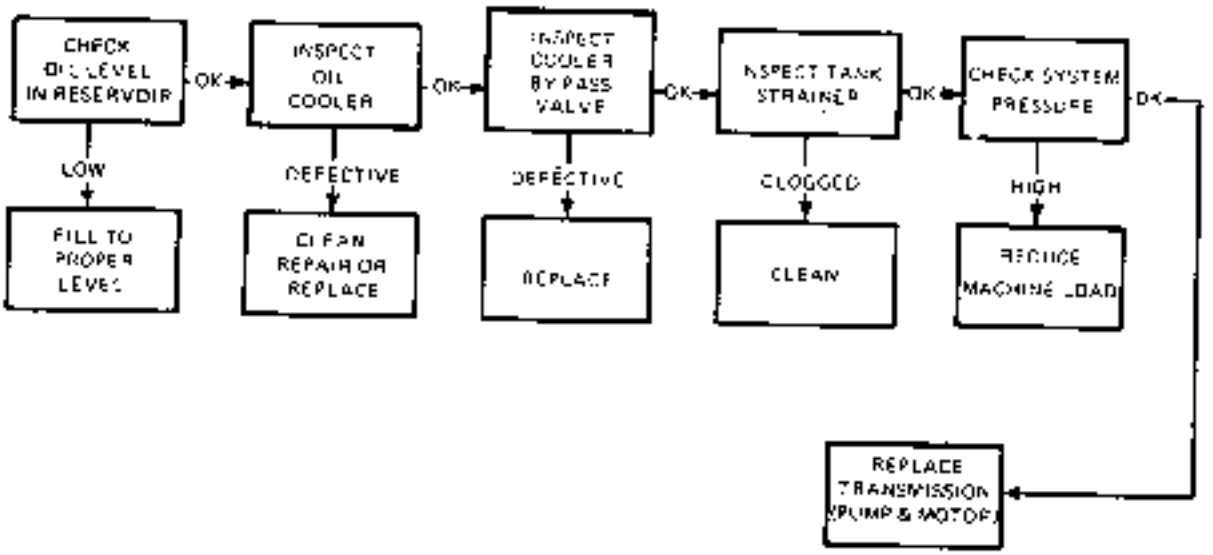
FIGURE J-35

TROUBLE SHOOTING PROPEL SYSTEM

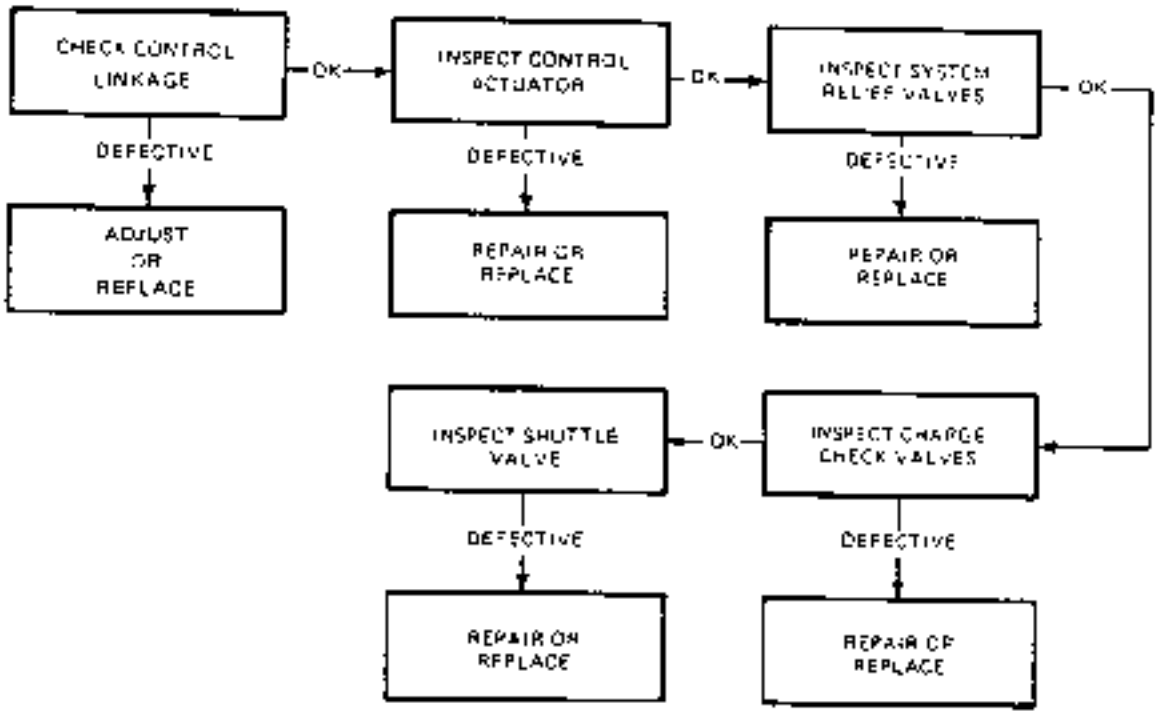
NEUTRAL DIFFICULT OR IMPOSSIBLE TO FIND



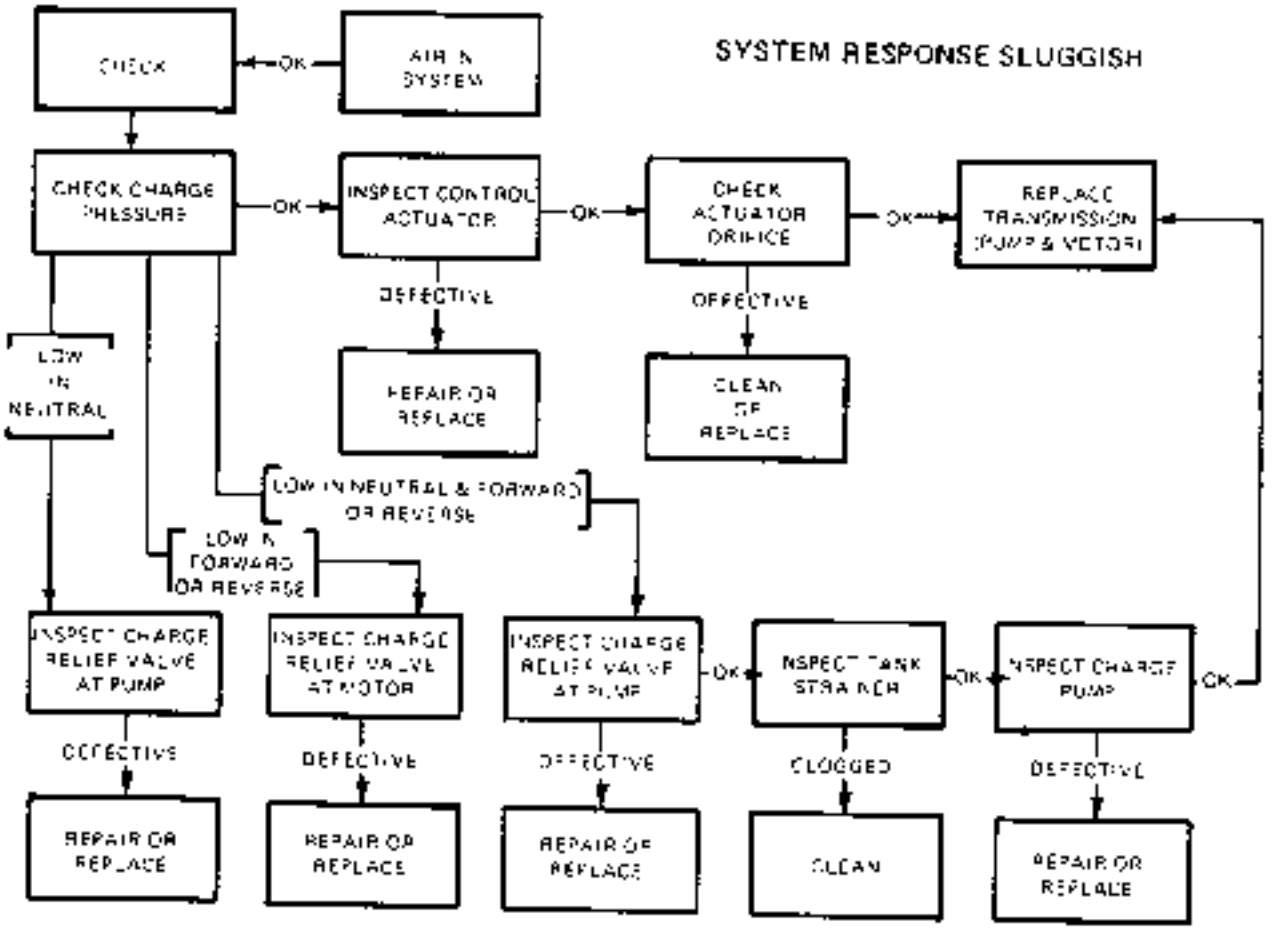
SYSTEM OPERATING HOT



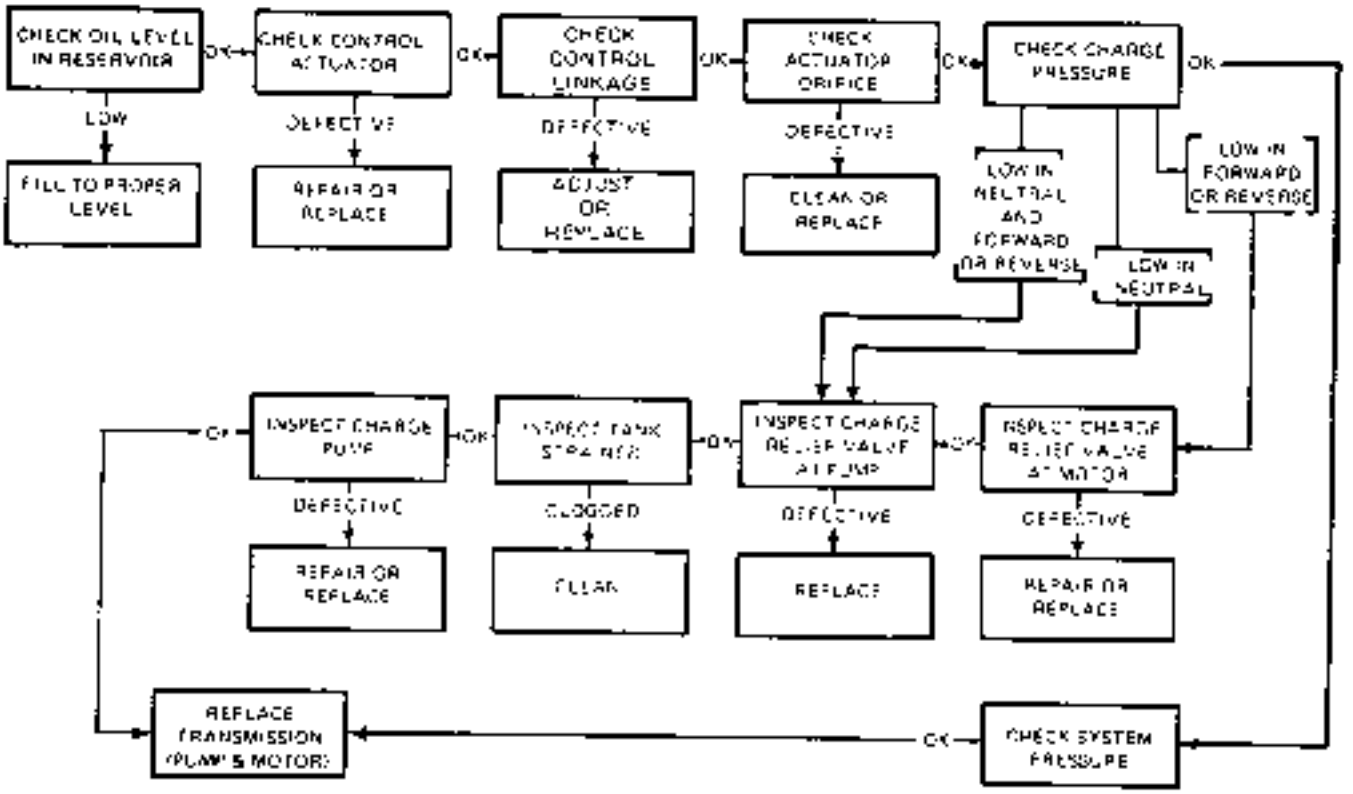
TRANSMISSION OPERATES IN ONE DIRECTION ONLY



SYSTEM RESPONSE SLUGGISH



SYSTEM WILL NOT OPERATE IN EITHER DIRECTION



FEEDER HYDROSTATIC SYSTEM

START UP PROCEDURE

This procedure must be followed when a unit is repaired or replaced.

1. Prior to installing the transmission, inspect for damage during shipment and handling. Make certain all circuit components (reservoir, hoses, fittings, heat exchanger, etc.) are clean prior to installing and filling with fluid.
2. Fill the reservoir with recommended hydraulic fluid which should be passed through a ten (10) micron (nominal) filter prior to entering the reservoir. Never reuse fluid.
3. The inlet line leading from the reservoir to the pump housing on the transmission must be filled prior to start up. If gravity feed does not fill this line, it must be filled manually. Remember that the maximum inlet exceed 5 in. hg. Check inlet line for properly tightened fittings and be certain it is free of restrictions.
4. Install a pressure gauge (500 PSI) in the charge pressure port with a short section of hose and a snubber or needle valve to dampen pulsations. Charge pressures should read as follows after start up. 18 Series:

   100 PSI minimum @ 1750 RPM

5. Start the Finisher and run at the lowest possible RPM until charge pressure has been established

---

CAUTION: Never start the Finisher unless the swashplate is in the neutral (zero angle) position or internal transmission damage can occur. This applies to any subsequent start-ups as well

---

6. Once charge pressure has been established increase the speed to full RPM. If Charge Pressure is not maintained at the proper setting (it may increase but not decrease), shut down system and determine cause.
7. Run system at full input and output speeds and observe Charge Pressure.
8. Operate system for at least fifteen (15) minutes then shut down and replace the inlet filter. Remove gauge and plug port. Check fluid level in reservoir.
9. Transmission is ready for operation.

MINOR REPAIR PROCEDURES

Service Kits are available for repairing the areas noted. Consult Parts List for Model Number for specific Service Kit and component part numbers.

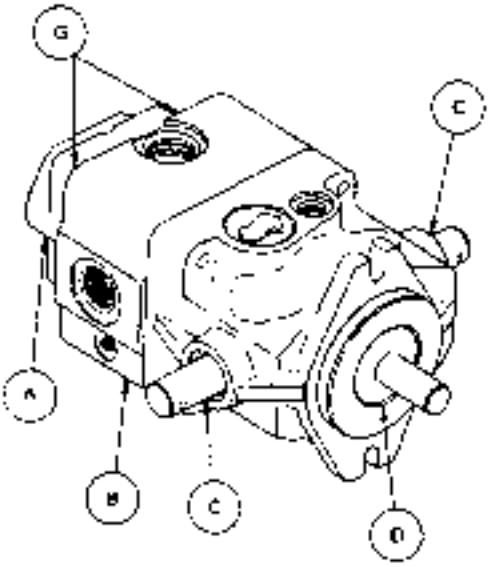


FIGURE J-33 – Pump Variable Displacement

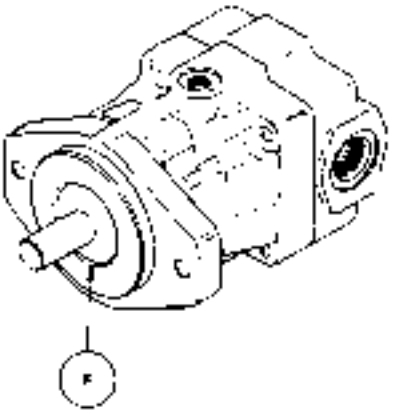


FIGURE J-34 – Motor Fixed Displacement

AREA OF REPAIR (Refer to Figures J-33 & J-34)

KIT	DESCRIPTION
A	Charge Pump
B	Charge Relief Valve
C	Trunnion Seal
D	Input Shaft Seal
F	Output Shaft Seal
G	Charge Check Valves

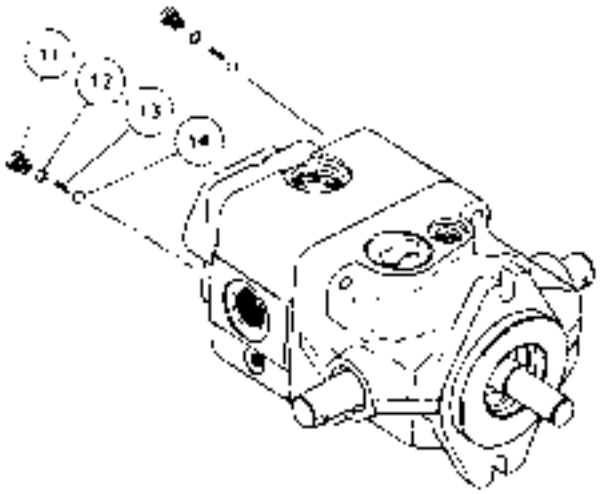
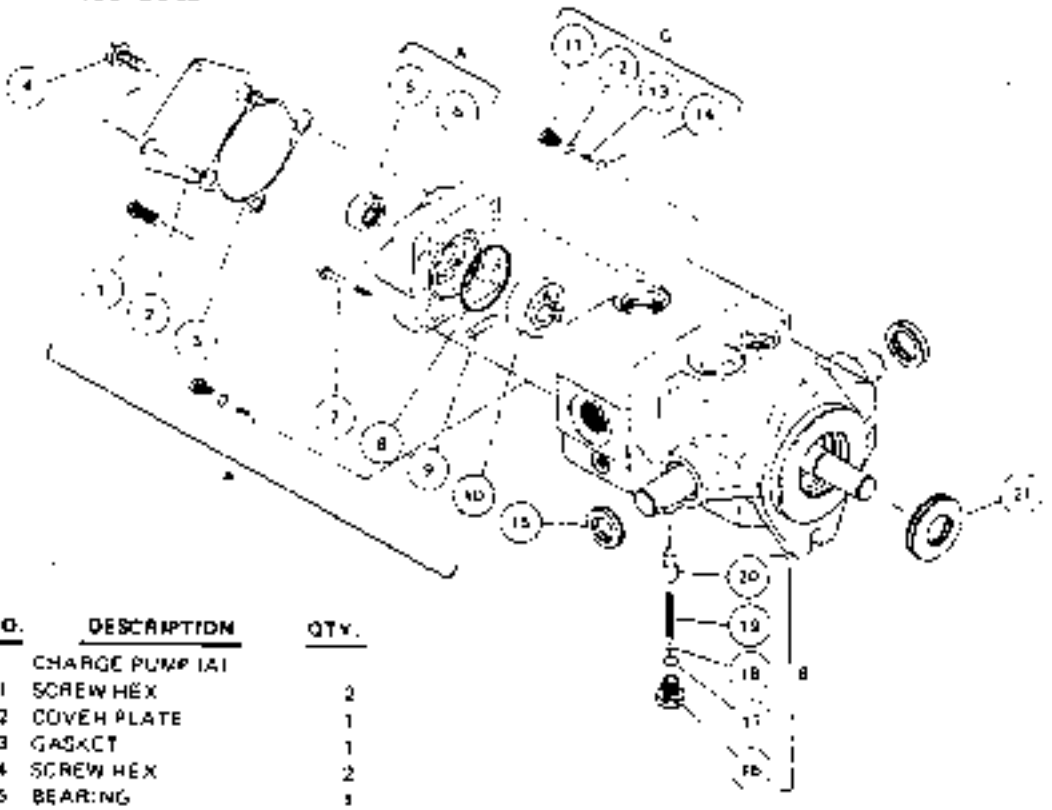


FIGURE J-35

CHARGE CHECK VALVES (Refer to Figure J-35)

Remove slotted head plug (11) then slide the spring (13) and ball (14) out of the end cap. Inspect the ball and the mating seat in the end cap for damage. Remove any foreign material in the valve area. Replace parts as required and re-install into end cap. In some instances the plugs (11) may not clear the charge pump housing. If this happens, remove the four (4) screws holding the housing to the pump and rotate it out of the way. Be certain to keep proper orientation of charge pump housing to insure correct rotation.



NO.	DESCRIPTION	QTY.
	CHARGE PUMP (A)	
1	SCREW HEX	2
2	COVER PLATE	1
3	GASKET	1
4	SCREW HEX	2
5	BEARING	1
6	HOUSING CHARG PUMP	1
7	SCREW-HEX	2
8	O-RING	1
9	PIN-DRIVE	1
10	CHARGE PUMP (GEROTOR)	1
	CHARGE CHECK VALVES (G)	
11	PLUG	2
12	O-RING	2
13	SPRING	2
14	BALL	2
	TRUNNION SEAL (C)	
15	SEAL-LIP	2

NO.	DESCRIPTION	QTY.
	CHARGE RELIEF VALVE (B)	
16	PLUG-HEX	1
17	O-RING	1
18	SHIM	A/R
19	SPRING	1
20	POPPET	1
	INPUT SHAFT SEAL (D)	
21	SEAL LIP	1

FIGURE J-36 – General Parts Identification

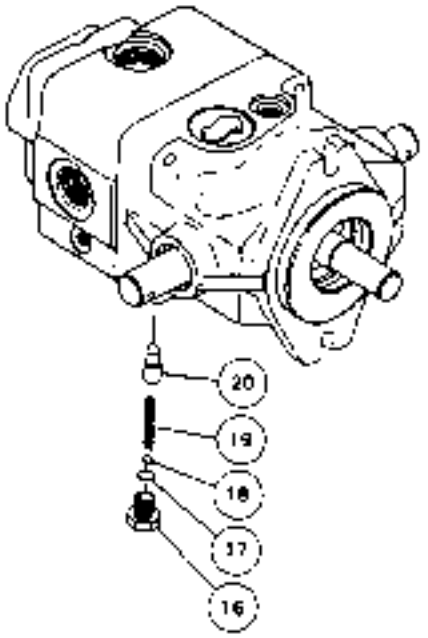


FIGURE J-37

CHARGE RELIEF VALVE (Refer to Figure J-37)

Remove plug (14) then slide out spring (19) and poppet (20) out of the end cap. Do not alter the shims (17) or interchange parts with another valve. Inspect the poppet and seat in end cap for damage and remove any foreign material in the valve area. Replace parts as required and reinstall into end cap bore.

REPLACEMENT OF SHAFT & TRUNNION SEALS (Refer to Figures J-38 & 39)

Lip type seals are used throughout these transmissions. These seals can be replaced without major disassembly of the transmissions; however, replacement of either the input or output seal requires removal of the transmission from the machine.

Pry the seal carefully out of the housing bore, using care not to distort the housing or damage the bore or shaft. Once removed the seal is not reusable.

Prior to installing the new seal, polish the shaft extension, wrap it in thin plastic and lubricate with clean hydraulic oil to insure the seal is not damaged during assembly. Slide the seal over the shaft end press into housing bore.

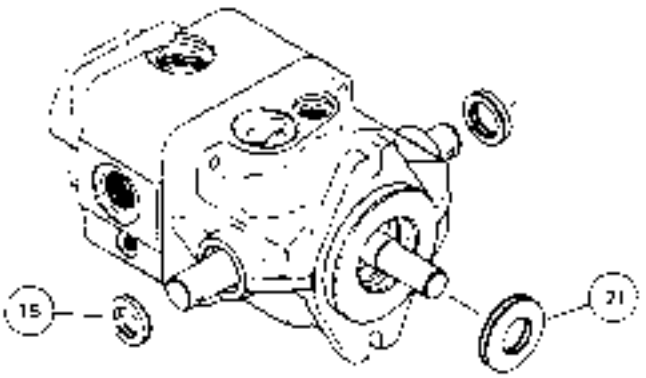


FIGURE J-38

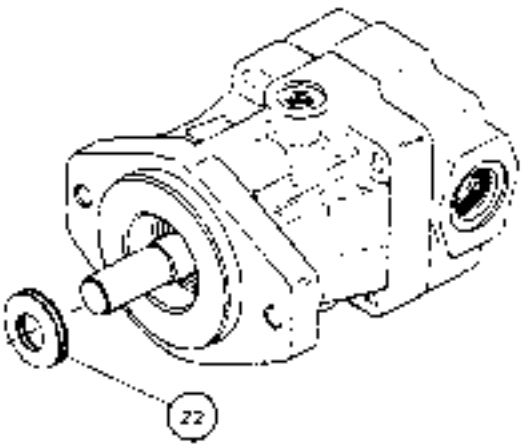


FIGURE J-39

TROUBLE SHOOTING PROCEDURE

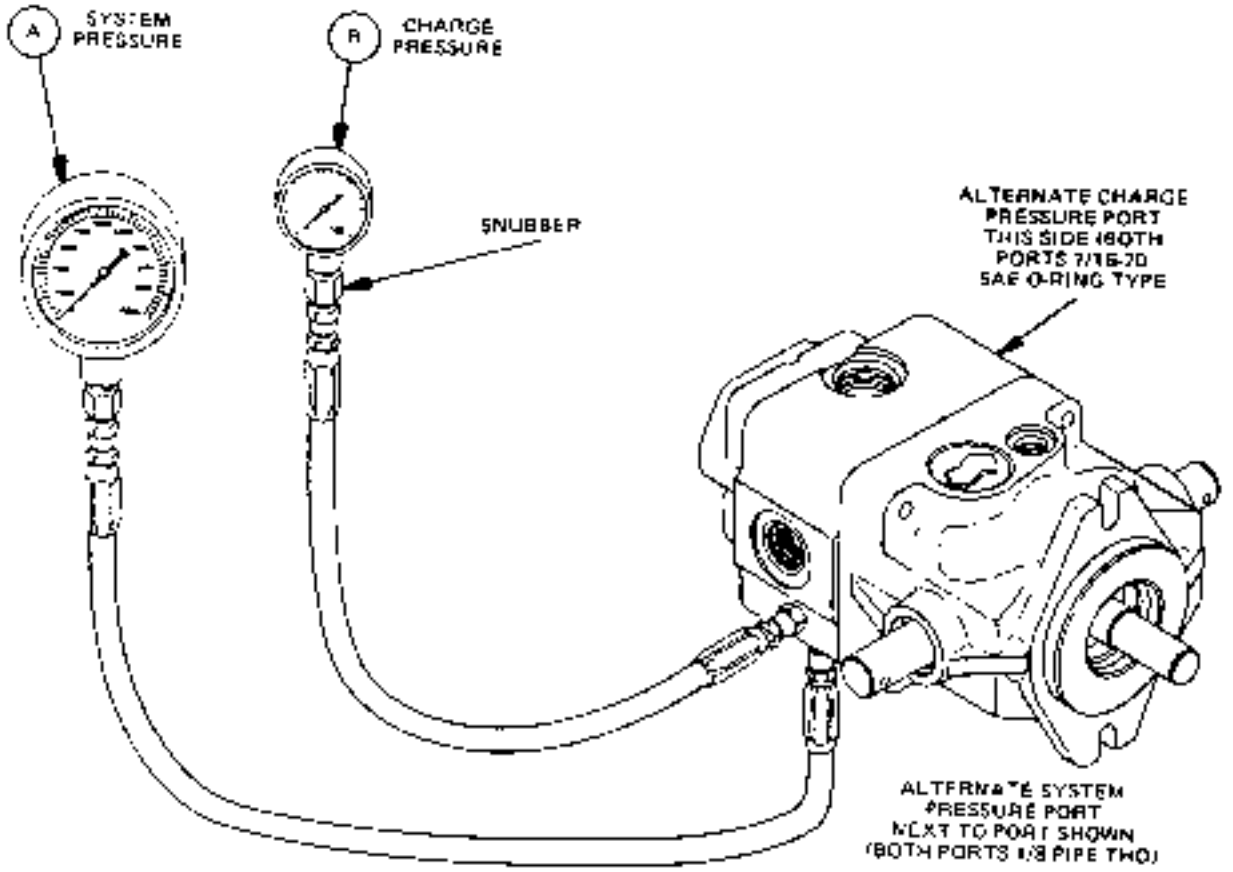
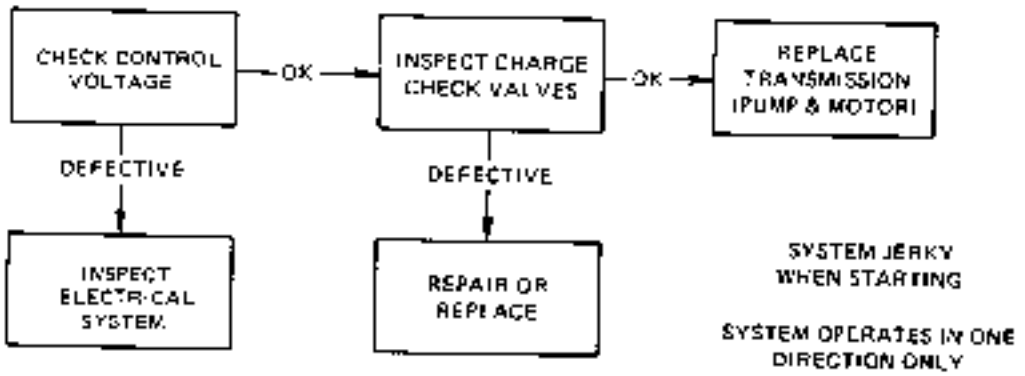


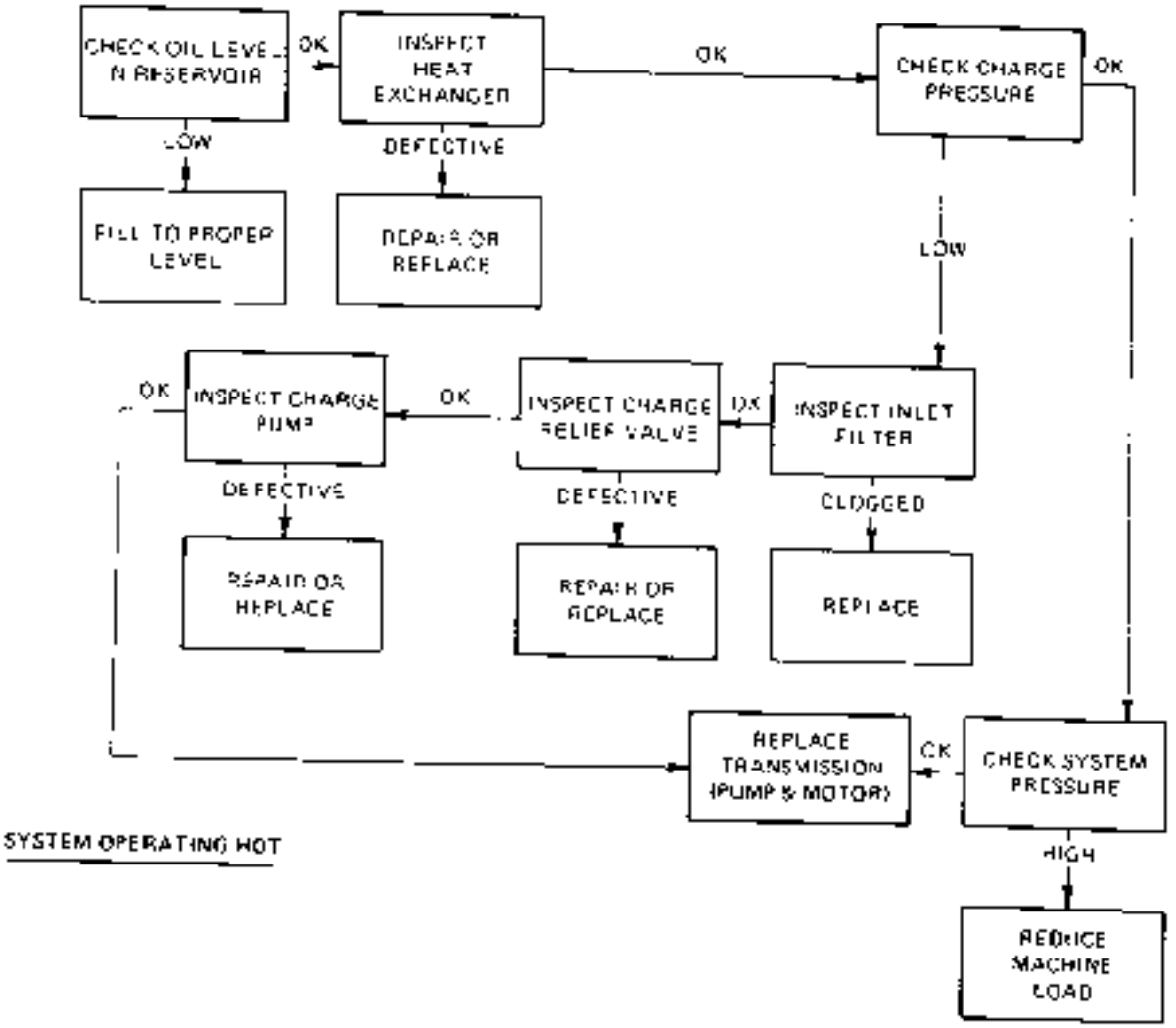
FIGURE J-40 — Typical Gauge Installation

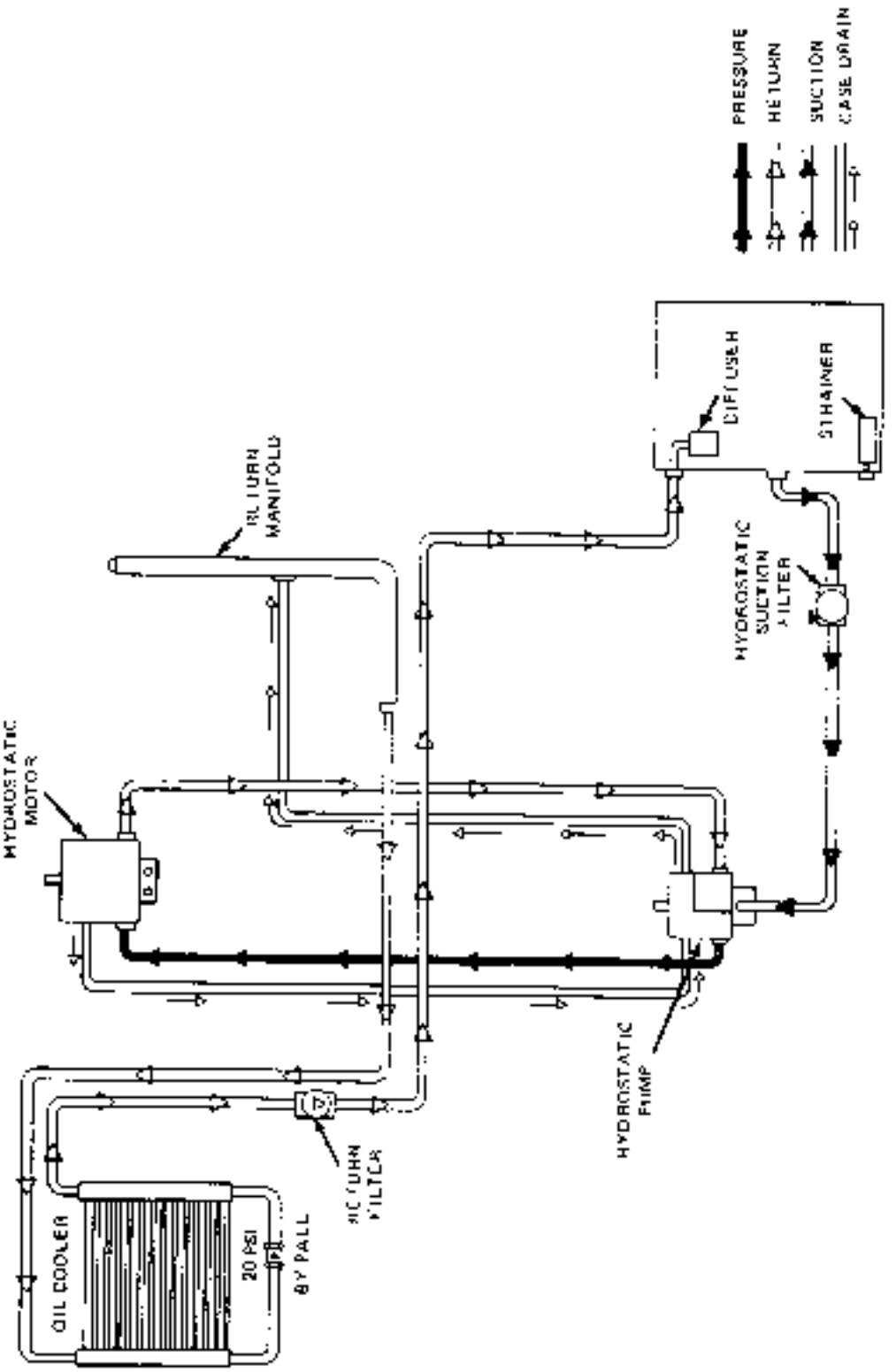
A. System Pressure gauge with 0 to 10,000 PSI Range
B. Charge Pressure gauge with 0 to 500 PSI Range

Snubbers are recommended to protect gauges. Frequent gauge calibration is necessary to insure accuracy. Input speed should be at or near max. rpm when taking gauge readings.

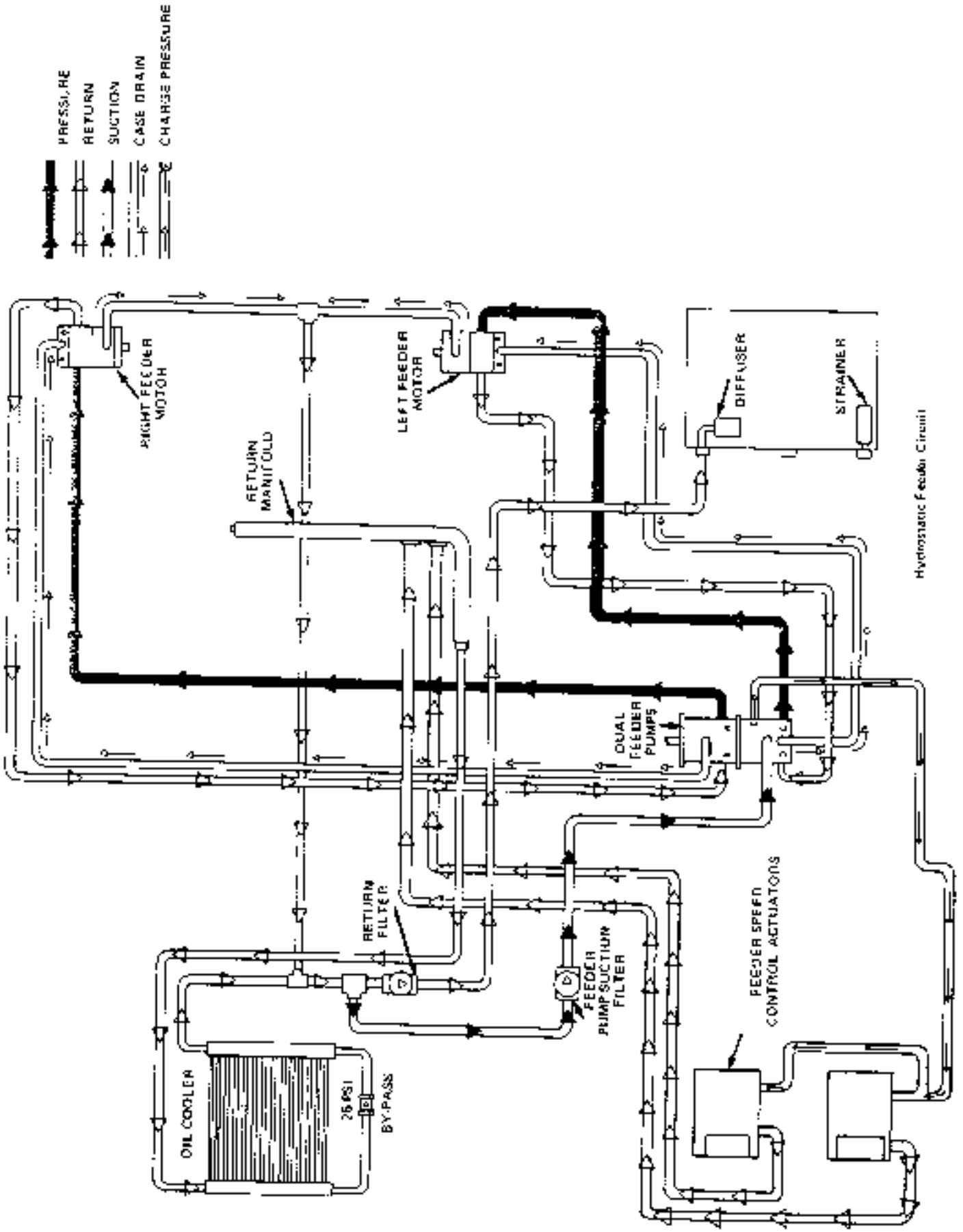


TROUBLE SHOOTING PROCEDURE





Hydrostatic Propel (Forward shown for one Crawler)



INDEX

DESCRIPTION AND PURPOSE OF DISPLACEMENT VALVE

INTRODUCTION.

The Displacement valve is used in conjunction with the hydrostatic systems which are utilized to drive the tractor wheels. The valve used on the Finisher is used to control the flow of oil to and from the servo cylinders within the hydrostatic pump. (Refer to Figure J-41).

In the case of the wheel drive system, the Displacement valve is operated by the speed control levers at the operators panel. The movement of the levers increases or decreases the travel, or paving speed of the Finisher.

CONTROL AND FUNCTION

In the description of hydrostatic circuitry, Section J-1, it is pointed out that the movement of the Displacement valve from the neutral position directs hydraulic oil to one of the servo cylinders in the pump. The pressurizing of one cylinder, while exhausting the other cylinder, moves the pump swashplate to a predetermined position corresponding to the position of the Displacement valve. When the Displacement valve lever is in neutral the spool in the valve returns to the neutral position, blocking the ports to the servo cylinders and trapping the oil. The amount of oil trapped in the servo cylinders determines the angle of the pump swashplate. The angle of the pump swashplate determines the flow of oil in the system which in turn controls the output speed of the hydrostatic motor.

The valve spool on the Displacement valve can be actuated manually with a control arm. The only time this is done is when trouble shooting for hydraulic failures.

When the spool is moved, hydraulic oil is directed through an orifice, Figure J-42, to one of the pumps servo cylinders. One servo is pressurized while the other is ex-

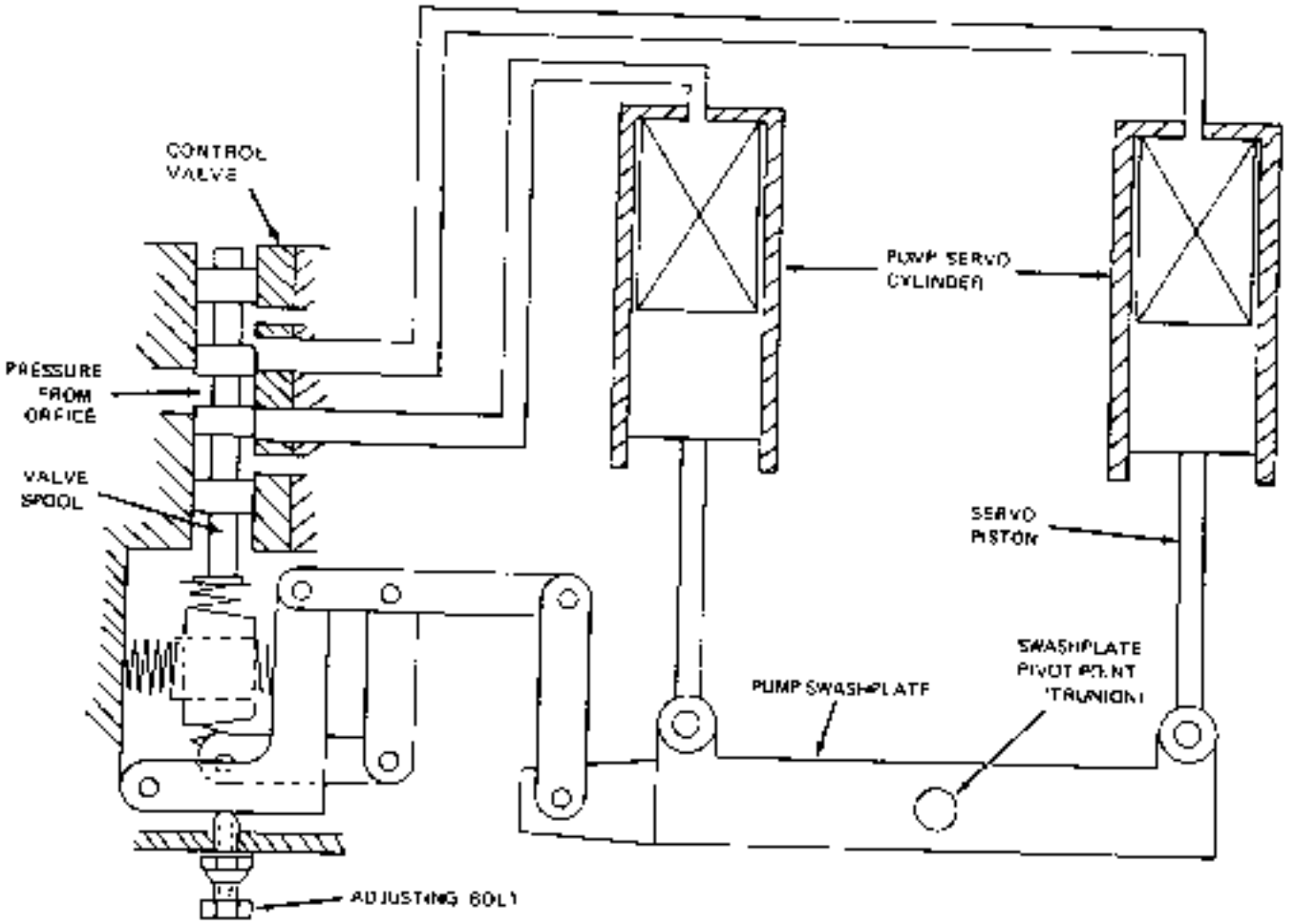


FIGURE J-41 — Hydrostatic Pump & Hydrotransmission Valve

located. (Refer to Figure J-41). The resistance of the mechanical linkage connecting the swashplate to the control valve works against the resistance of the control spring. These two forces working against one another hold the valve spool in neutral and trap the oil in the pump servos. Any variation of pressure or work load applied to the hydrostatic system is fed back through the swashplate and the control linkage to the control valve. (Refer to Figure J-41). The feedback pressure is counteracted and tends to hold the control spool in the neutral, or centered position.

With the oil trapped in the pump servo's, the swashplate maintains its predetermined position, and in turn holds constant or controls the drive of the hydrostatic system.

DISPLACEMENT VALVE ADJUSTMENT

The only adjustment required on the Displacement valve is the centering of the valve spool. The valve spool has a traveling distance of .030. This amounts to .015 in or out in each direction. If the machine has a tendency to creep in one direction or the other, chances are the valve spool is not centered. (See adjustment procedure below)

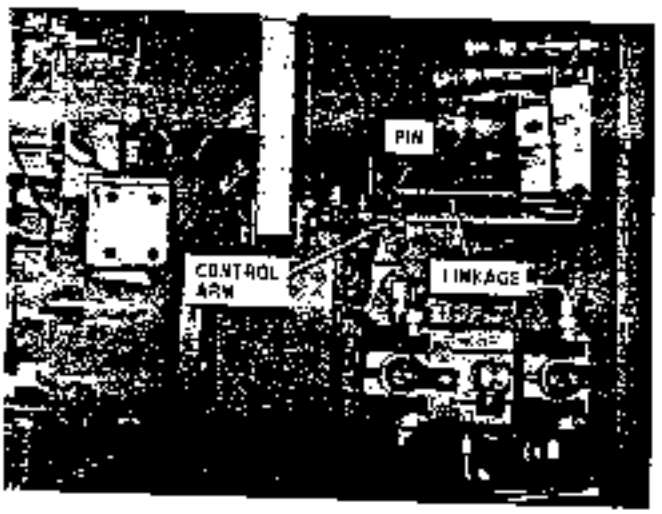


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FIGURE 41A – Displacement Valve

TO CENTER SPOOL OF DISPLACEMENT VALVE
(Refer to Figure J-41A)

To adjust the spool to gain positive control and overcome machine creepage is:

1. Remove pin connecting control linkage to control arm on displacement valve.
2. Adjust linkage until the pin can be replaced without moving the control arm from neutral. Whether movement from neutral of the arm will cause the machine to creep

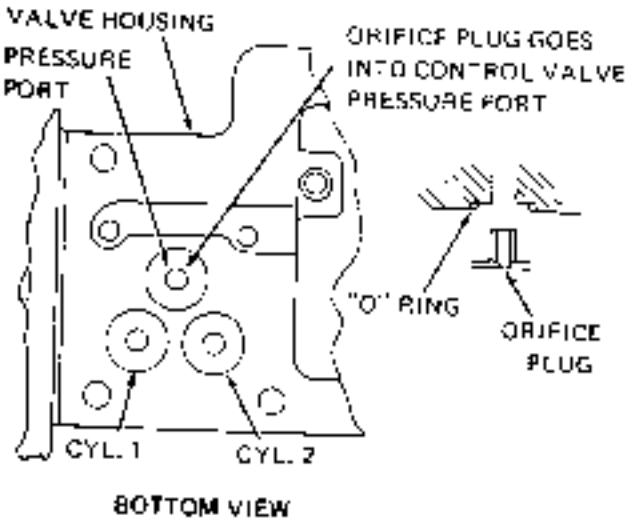

FIGURE J-42 – Orifice Plug

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TRACTOR HYDRAULIC SYSTEM

There are three main hydraulic systems on the finisher, the hydrostatic propel system, hydrostatic feeder system and the tractor hydraulic system.

The propel and feeder hydrostatic systems are outlined in Section J-1.

The tractor hydraulic system is comprised of three sub-systems. Auto leveling system, Screed Drive system and the Screed hoist and Basket dump system.

Total capacity including the three sub-systems, storage tank and hydrostatic systems is approximately 60 gallons.

The gear type, constant delivery, double pump is direct driven from the pump drive gear box. The auto leveling, basket and screed lift section of the pump delivers 8 GPM at 2310 RPM and 2500 PSI. The screed drive section of the pump delivers 12 GPM at 2310 RPM and 1500 PSI.

AUTO LEVELING SYSTEM (OPTIONAL) Refer to Figure J-47

COMPONENTS

1. Relief valve, set to release at 600 PSI
2. Two servo control valves. Servo valve actuated by electrical signal from the grade control or slope control sensors.
3. Leveling cylinder (2), double acting single rod end
4. Filter located on the inlet to the servo valve manifold. Keep clean, may cause sluggish action of proportional grade controls.

OPERATION

1. CIRCULATING PHASE - applies when no work is being done. Oil flows from the tank, through the shaft end of the pump, through the flow divider past the relief valve, through the filter, through the servo valve manifold block with the valve spools centered, through the return filter back to tank.
2. OPERATING PHASE - applies when servo valve spool is moved from center. Oil flows from tank, through the shaft end of pump, through the flow divider, past the relief valve, through the filter, through the servo valve to "raise" or "lower" the tow point of the leveling arms. Oil displaced from the opposite end of cylinders flows through return filter back to tank.

S-B-S SYSTEM (Refer to Figures 48, 49 & 50)

COMPONENTS

1. Basket dump valve, four way, three position, double solenoid operated. Solenoids actuated by switch on operator control console.
2. Screed hoist valve, four way, three position, double solenoid operated. Solenoids actuated by switch on operator control console. The above two valves are referred to as the "stacked valves" or "valve bank".
3. Main relief valve set to relieve at 2500 PSI.
4. S-B-S relief valve set to relieve at 1700 PSI.
5. Basket dump cylinders (2) double acting single rod end.
6. Screed hoist cylinders (2) double acting single rod end.
7. Shaft end of double pump.

OPERATION

1. CIRCULATING PHASE - applies when no work is being done. Oil flows from the tank, through the shaft end of pump, past the 2500 PSI relief valve, through the flow divider past the 1750 PSI relief valve, through the basket dump valve in the off position, through the screed hoist valve in the "lower" position, through the return filter back to tank.
2. BASKET DUMP PHASE - applies when the basket dump switch, on the operators station, is activated. Oil flows from the basket dump valve in either "raise" or "lower" position, to the basket cylinders. Oil displaced from the opposite end of the cylinders flows to the steering control valves.

NOTE: After basket is raised or lowered, screed hoist and steering will not function if basket dump switch is left in activated position.

3. SCREED HOIST PHASE -

NOTE: When raising screed, machine cannot be steered.

The screed hoist valve has three positions, raise, lower and hold. In "raise" position, oil flows from the basket dump valve, through the screed hoist valve, to the screed hoist cylinders. In "hold" position, the port to the cylinders is blocked and oil flows to the steering circuit. In the "lower" position, the port to the hoist cylinders is opened to the return line, allowing screed to lower from its own weight.

4. BY - PASS - PHASE - applies when pressure in the S-B-S System rises above 1700 PSI. Relief valve will open returning oil to tank.

HYDRAULIC SYSTEM MAINTENANCE AND SERVICE

The hydraulic system operates the screed hoist, basket dump, steering and the optional grade control system.

IMPORTANT - The oil level should be checked frequently. Keep oil clean and free of dust and sludge, as well as water. The tank filler has a breather screen and filter screen. Keep these screens clean. Drain water from tank weekly.

The relief valves, basket dump valve, screed hoist valve are located under the front lift up cover on left side of machine near hydraulic tank.

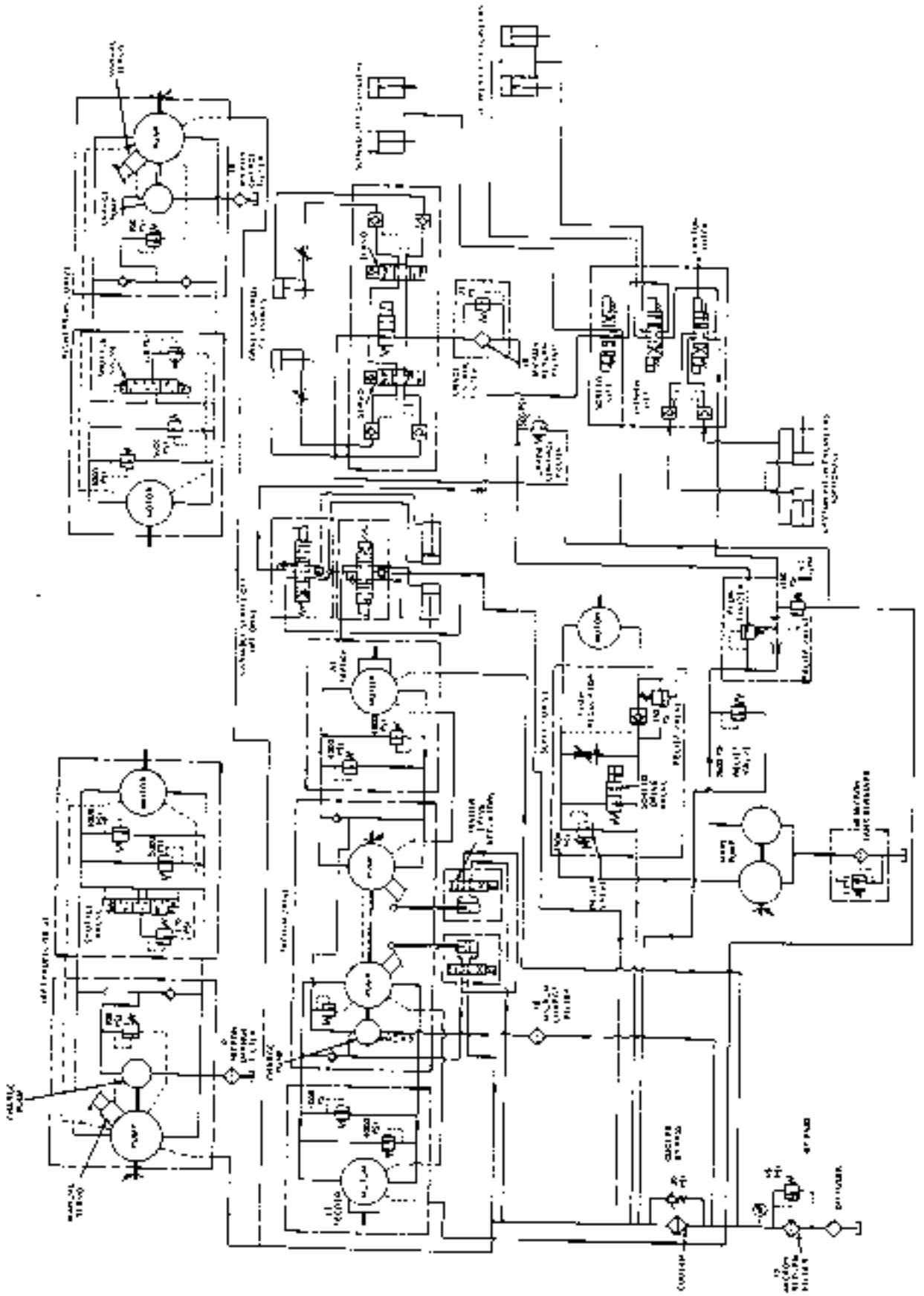

FIGURE J-44 – Hydraulic Schematic

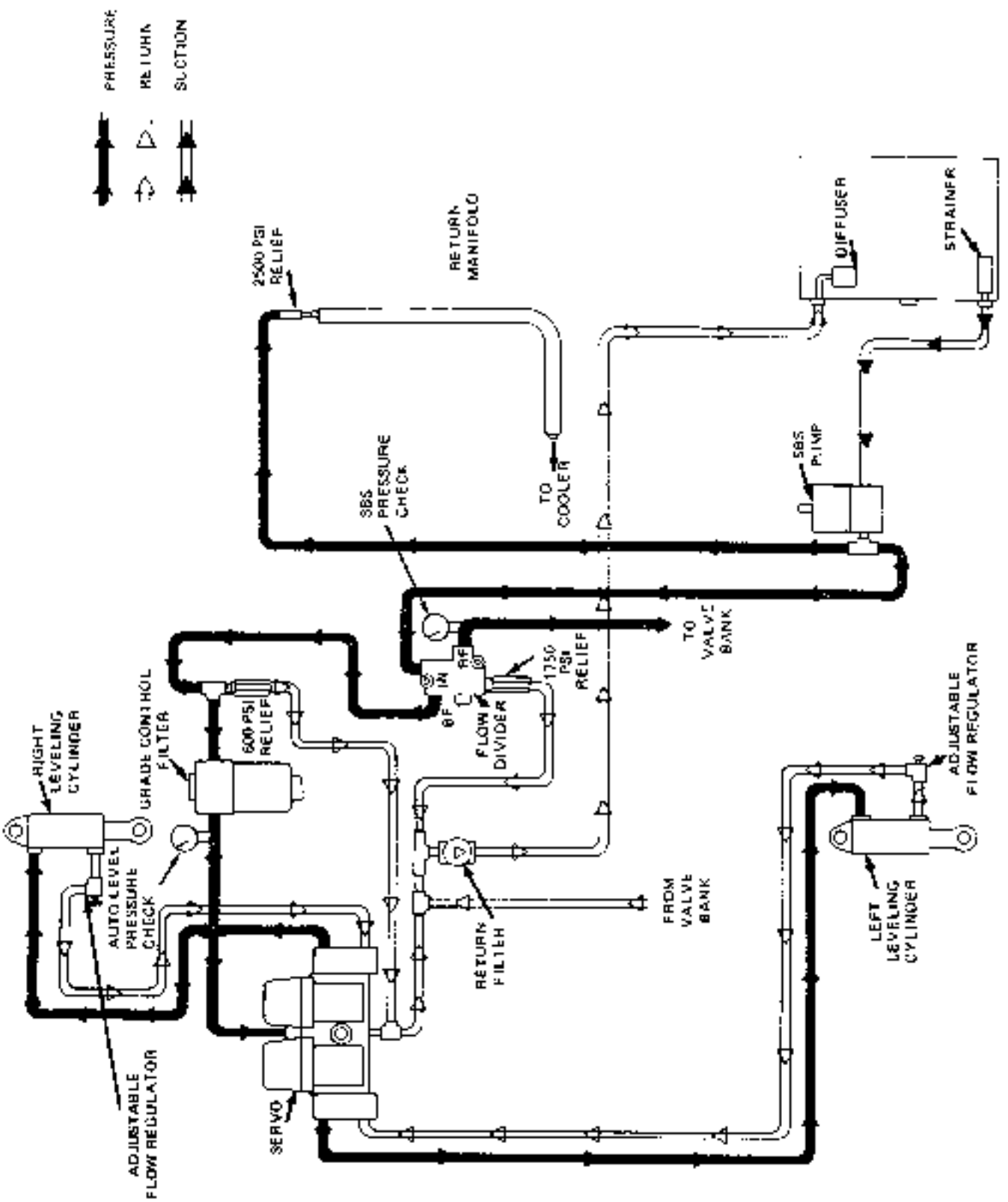

FIGURE J-46 – Auto Leveling Circuit Piping

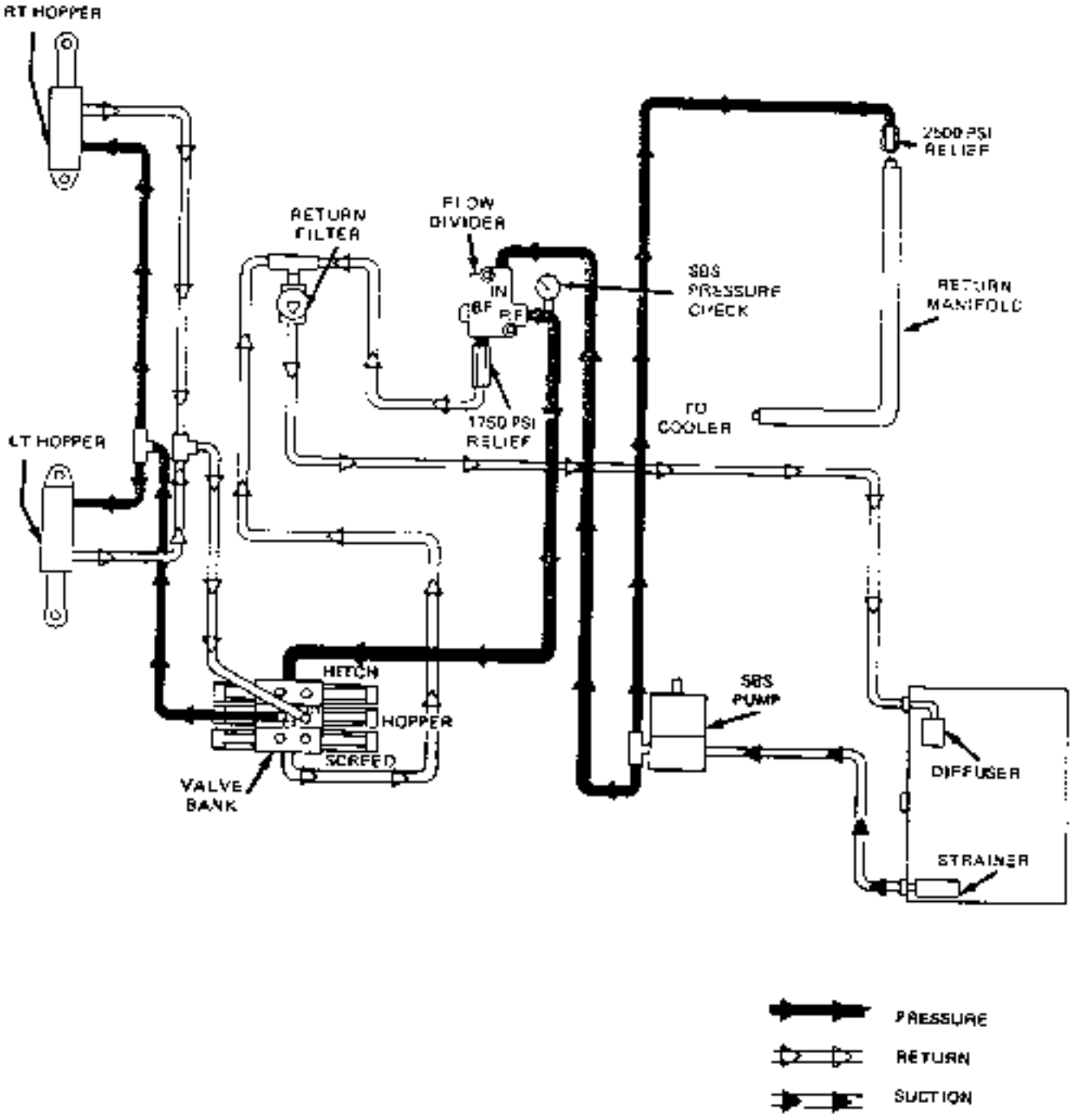

FIGURE J-48 – Hopper Circuit Piping

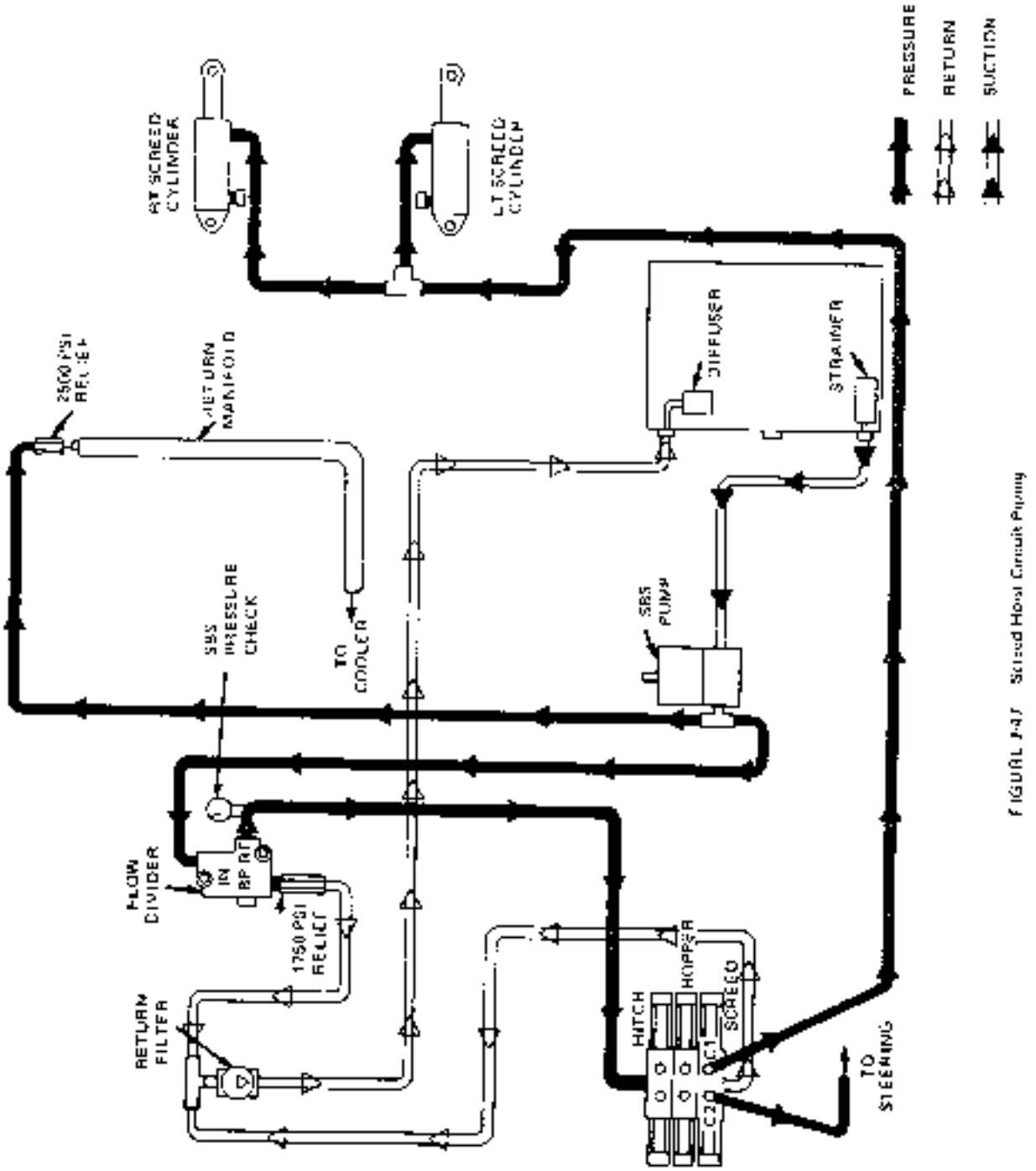

FIGURE J-3.5 Screed Hoist Circuit Piping

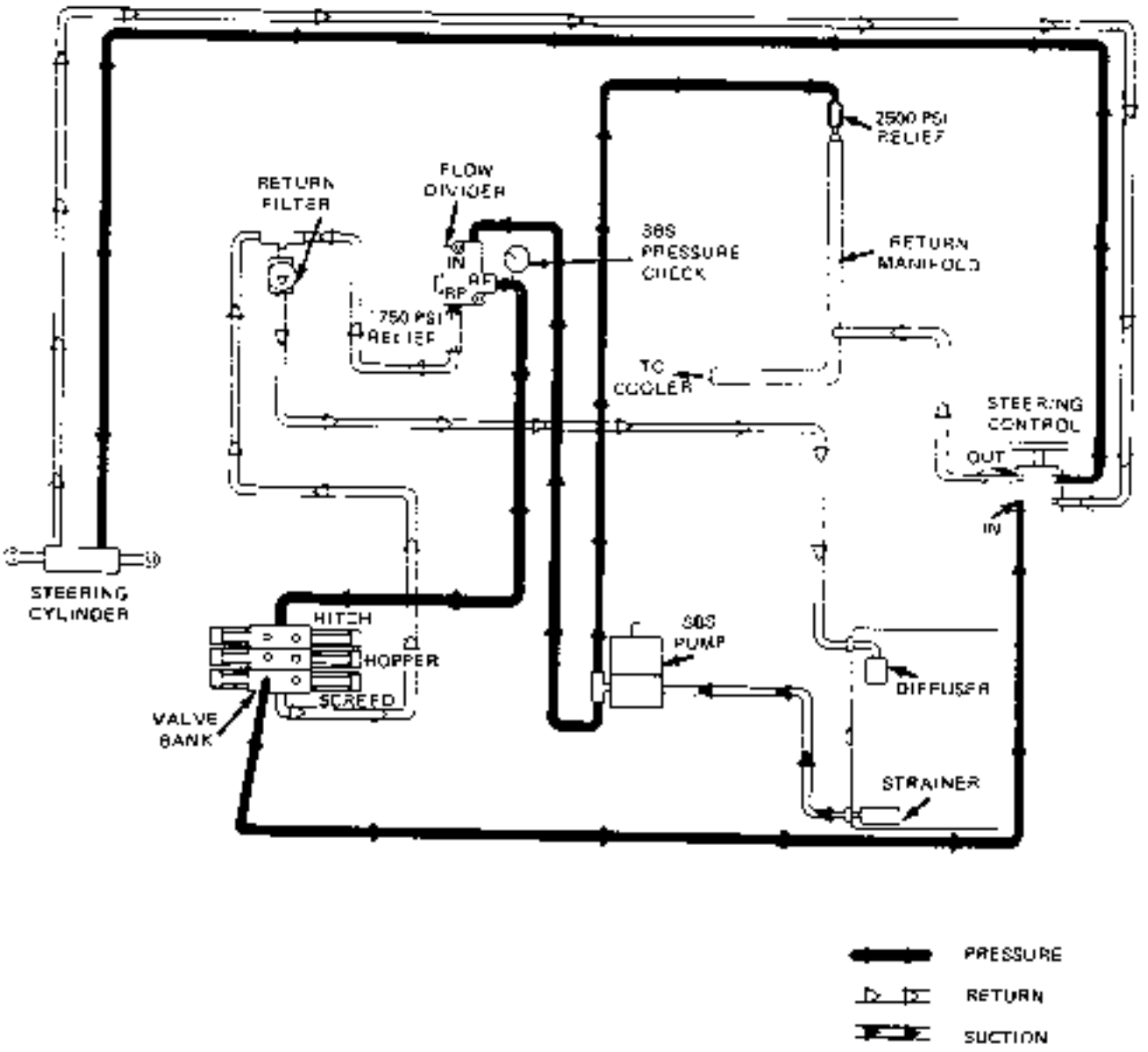

FIGURE J-4B – Steering Circuit Piping

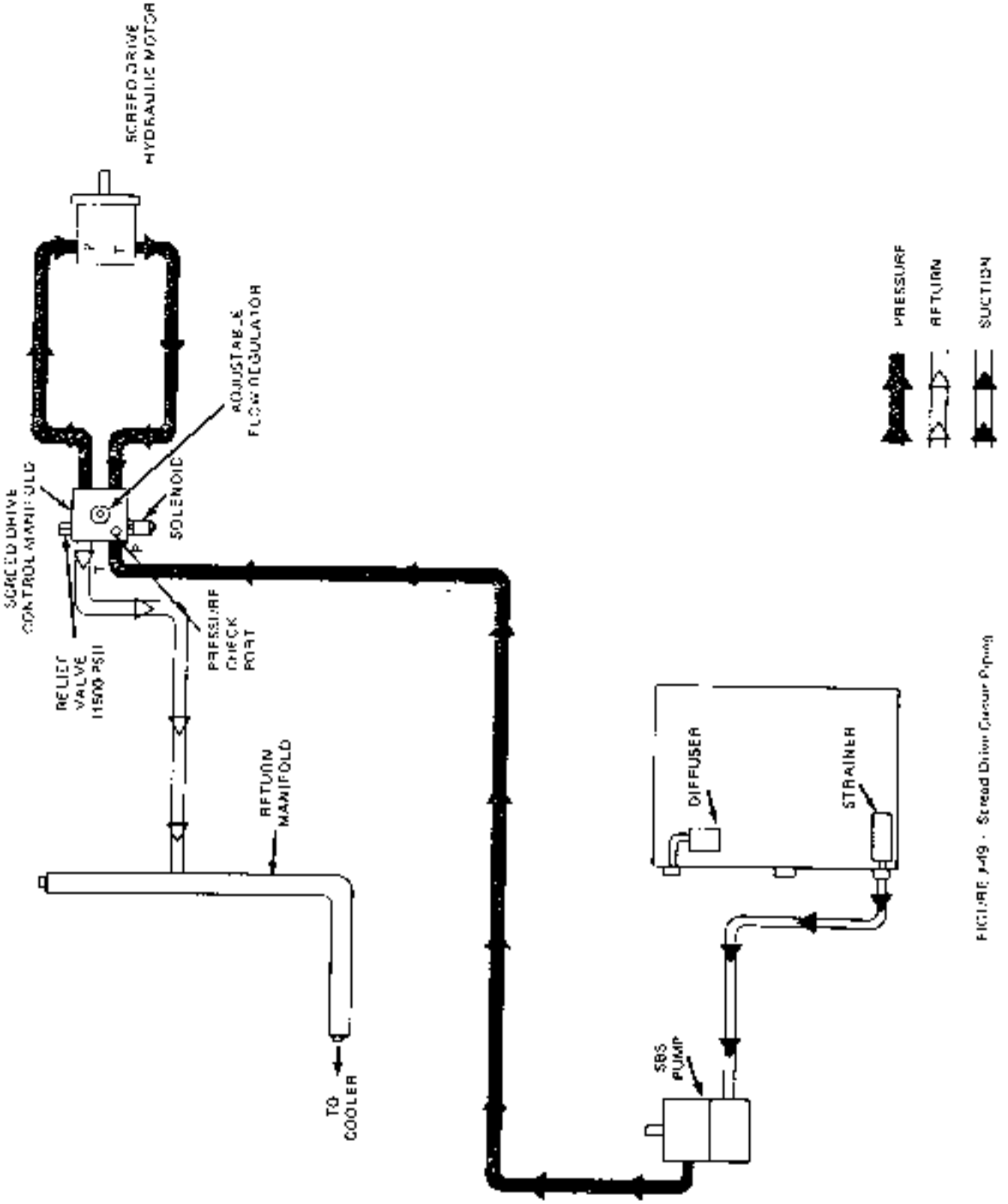

FIGURE J-49 - Screed Drive Circuit Pump

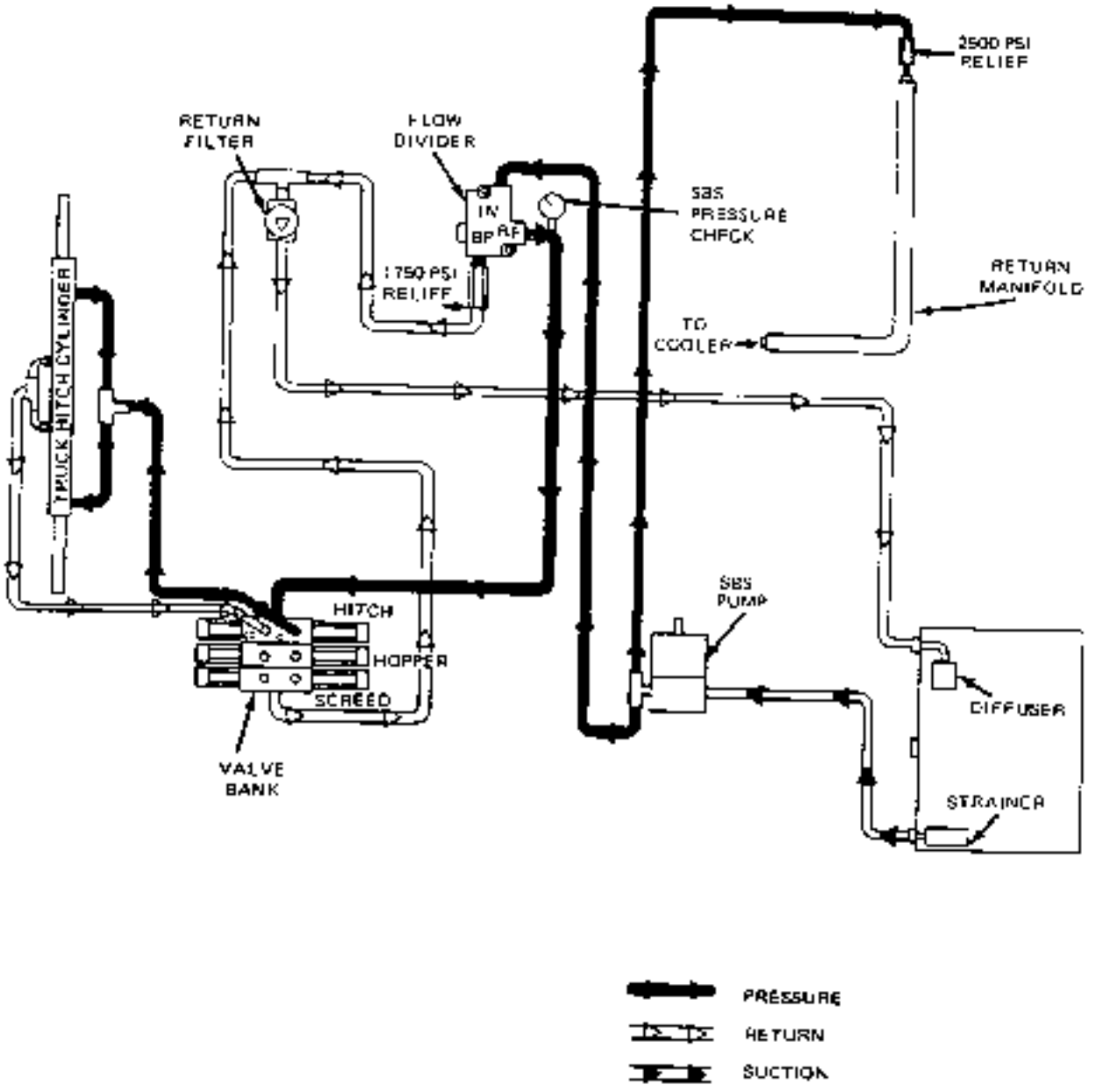

FIGURE J-60 – Truck Hitch Circuit Piping (Closed Position)

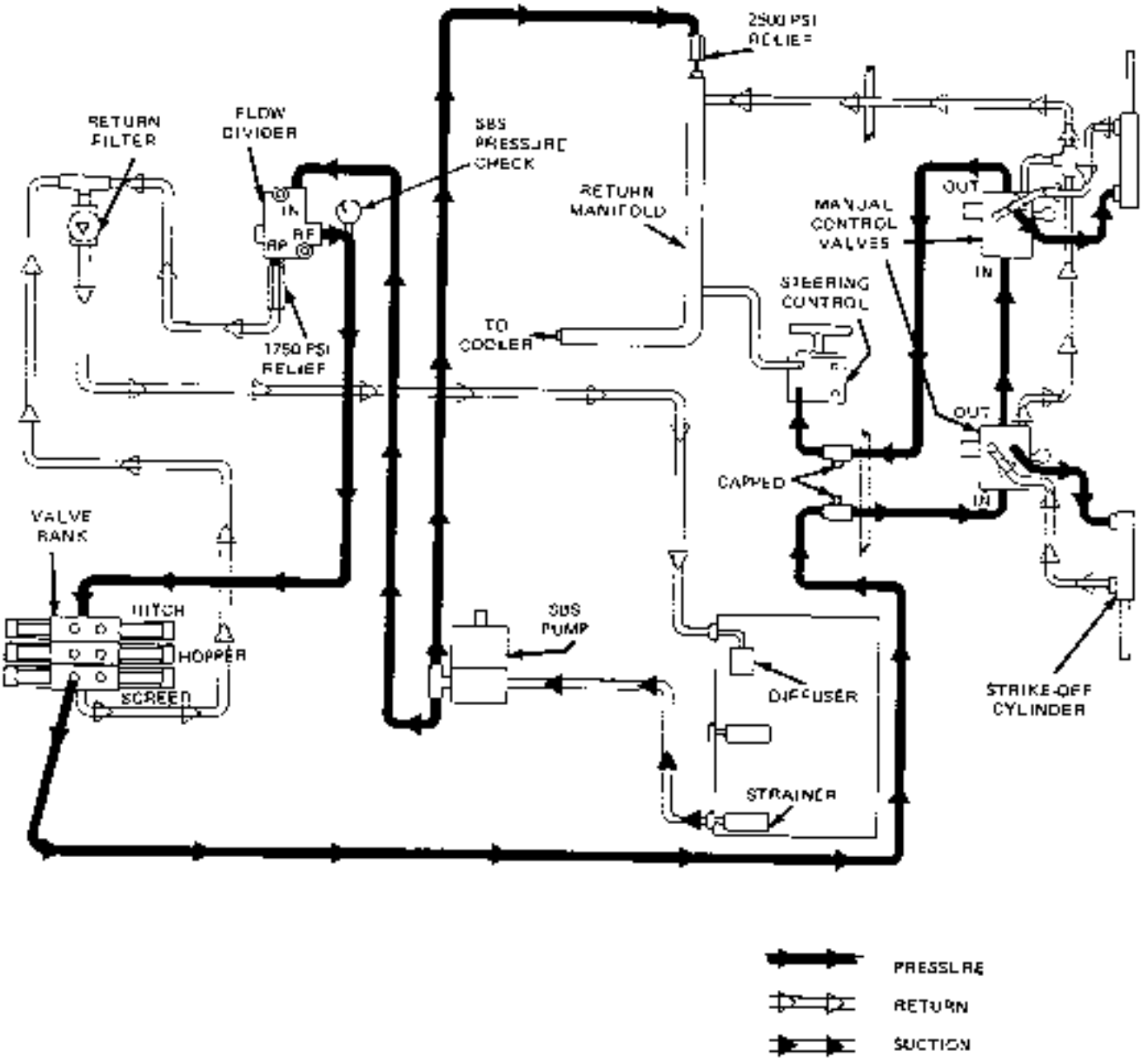

FIGURE J-51 — Variable Strike-off Circuit Piping

HYDRAULIC FLUID

FLUID RECOMMENDATIONS

Hydraulic fluids selected for use with Barber-Greene Finishers should be a quality product carefully selected with assistance from a creditable supplier.

Characteristics of the fluid selected should include:
Viscosity
Oxidation
Thermal Stability
Shear Stability
Low Temperature Fluidity
Anti-wear
Anti-corrosion
Anti-foam
Seal Conditioner For Buna-N and Viton Elastomers

The following types of fluids have been used successfully in the hydrostatic transmission: (1) anti-wear hydraulic oil, (2) automatic transmission fluid "Type F" and (3) hydraulic transmission fluid.

Most of the above fluid types have acceptable viscosity characteristics in the operating range of 10° F. to 200° F. The fluids selected should provide a minimum viscosity of 47 SUS at 210° F. and a maximum measured viscosity of 6,000 SUS at the lowest expected startup (–10° F.) temperature. Typical fluid properties are listed in Lubrication Section A.

Your best assurance for a quality product is the assistance that can be offered in its selection by a fluid supplier. The major oil companies are capable of providing suitable products. The Barber-Greene Service Department can also provide very capable assistance.

HYDRAULIC OIL TANK (Refer to Figure J-52)

The hydraulic oil tank is located under the hinged panel on the left side of the machine.

Located on the tank is a sight level gauge, tank breather and a drain plug.

NOTE: The tank strainer should be cleaned and the filters replaced each time the hydraulic oil is changed. This will increase the life of the pumps motors, valves and cylinders and maintain an efficient operating hydraulic system.

NOTE: Tank breather should be replaced once a season.

The hydraulic oil filters, filter the oil before entering the hydrostatic pumps. The micron filter is a replaceable element and should be replaced every 250 hours.

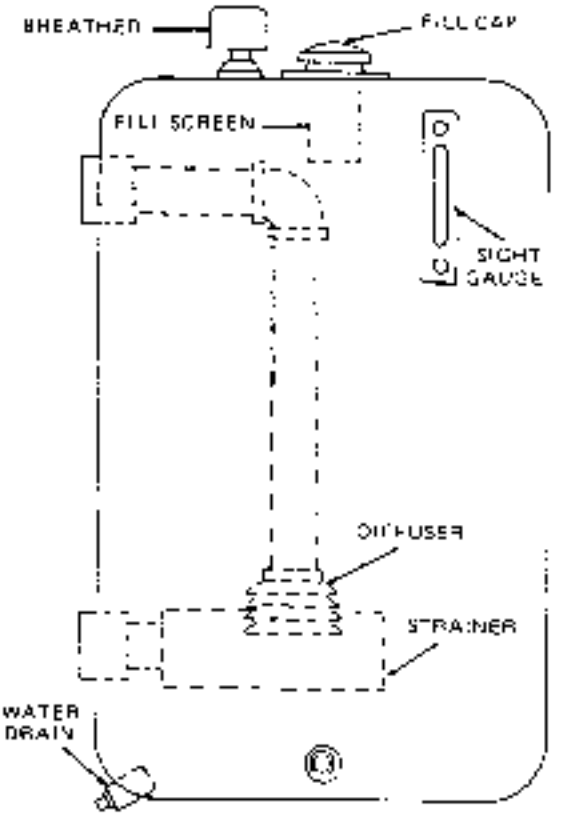

FIGURE J-52 – Hydraulic Oil Tank

FILTER GAUGE

Located on engine instrument panel. Constant 35 PSI indicates need for filter change.

TO REPLACE FILTER (Refer to Figure J-53)

The hydraulic filters are similar to automotive filters. Unscrew old filter cartridge and install new.

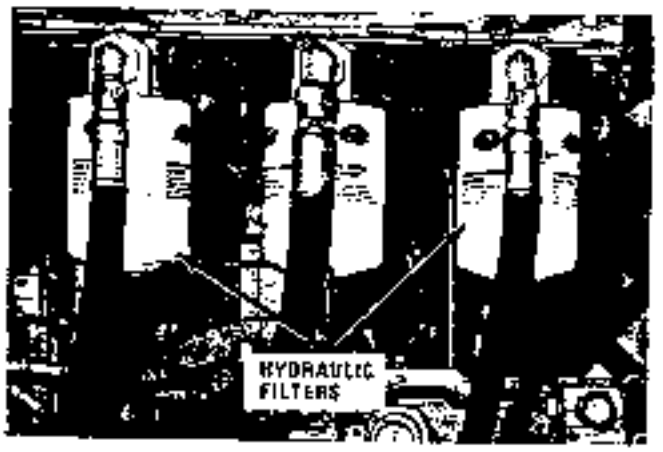

FIGURE J-53 – Hydraulic Filter 277738

HYDRAULIC PUMP

The double unit hydraulic pump is driven from the pump drive gear box.

IMPORTANT - Do Not Run Pump Without Oil

Field repairs, to the pump, is not advised. If pump is defective, replace it. Loss of hydraulic pressure or a heating, chattering pump will probably be due to lack of oil, clogged filters, or a dirty breather cap on the tank.

Sometimes foam in the system, due to air, can cause lack of pressure. Check suction manifold and suction line fittings for leaks.

REPLACING PUMP

Failure of a hydraulic pump, due to filter neglect or other reasons, results in further contamination of the hydraulic fluid.

The following procedure must be used when replacing a hydraulic pump, to prevent damage and failure of the re-

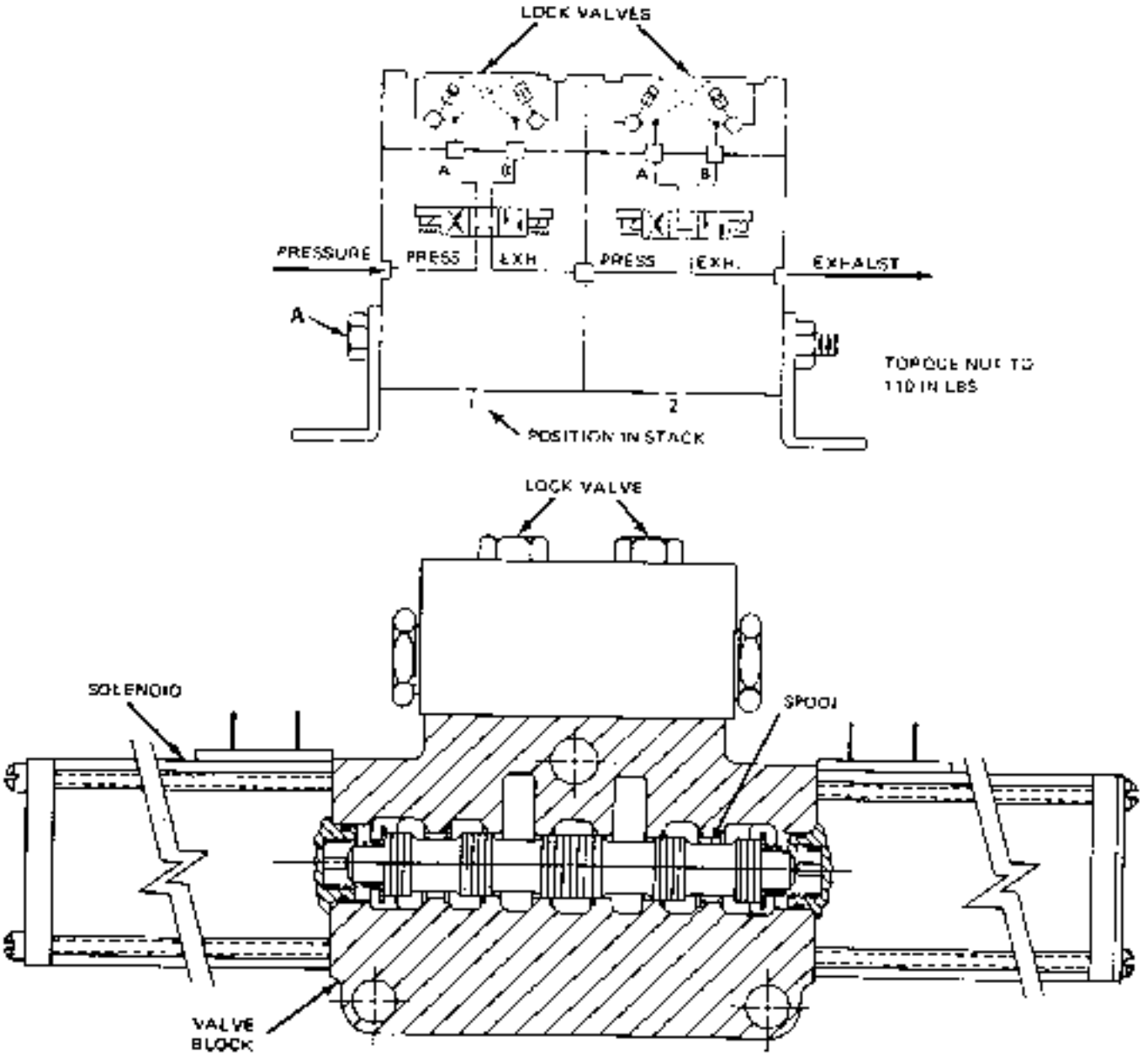

FIGURE J-64 - Hydraulic Valve Bank

placement pump, and to qualify for warranty consideration from the pump manufacturers.

1. Drain and flush hydraulic tank.
2. Flush suction manifold and suction lines to hydraulic pumps.
3. Remove and replace hydraulic micron filters.
4. Refill hydraulic tank with new hydraulic oil.
5. Prime hydraulic pumps and motors with new hydraulic oil.
6. Change micron filters after 1 day operation.

IMPORTANT - When Disassembling Any Hydraulic Unit, extreme care and cleanliness must be exercised. Work in a dust-free place, use clean tools, lintfree cloths and a clean cleaning agent.

CAUTION - Do not soak O-ring or packing in cleaning solvent.

HYDRAULIC VALVE BANK (Refer to Figure J-54)

The valve bank may be disassembled by removing the four (4) assembly rods (A) Figure J-54.

If a valve is sticking, and the solenoid checks out electrically, check the torque of the solenoid bolts (60 in. lbs.)

Disassemble the valve and check for foreign material, warped spool or scoring of the spool or valve body.

Do not attempt to replace a valve spool with another. Each valve spool is ground to fit that particular valve body. If a spool or body is faulty, replace the entire valve.

Note the flow of oil through the valve bank as shown in Figure J-54.

To maintain proper flow through the valve bank, three assembly procedures must be followed:

1. Port openings must be in proper position - C1 to C1 and C2 to C2.
2. Pipe plugs must be located in proper ports.
3. Check all teflon rings to be sure they are installed and not damaged.

LOCK VALVE (Refer to Figure J-56) Layton Hitch Optional

Creeping "up" of "down" of a hydraulic cylinder may be an indication of a faulty or sticking lock valve.

Remove end plug and check for foreign material that could be binding the piston or lodged on the seats. Also, check condition of "O" rings.

RELIEF VALVES

Main Relief

2500 PSI - Non-Adjustable

Located on return manifold.

S.B.S Relief

1750 PSI Cracking Pressure – Non-Adjustable

NOTE - Gauge reading will be up to 2200 PSI due to flow and system back pressure.

Located on Flow Divider in left wheel well.

Auto Leveling Relief

600 PSI – Non-Adjustable

Located above Flow Divider on left wheel well.

Screed Drive Relief

1500 PSI – Adjustable

Located on Screed Drive Control Manifold at rear of machine.

NOTE - All Relief Valve settings ±5%

Refer to Figure J-65 and J-66 for locations of pressure check points.

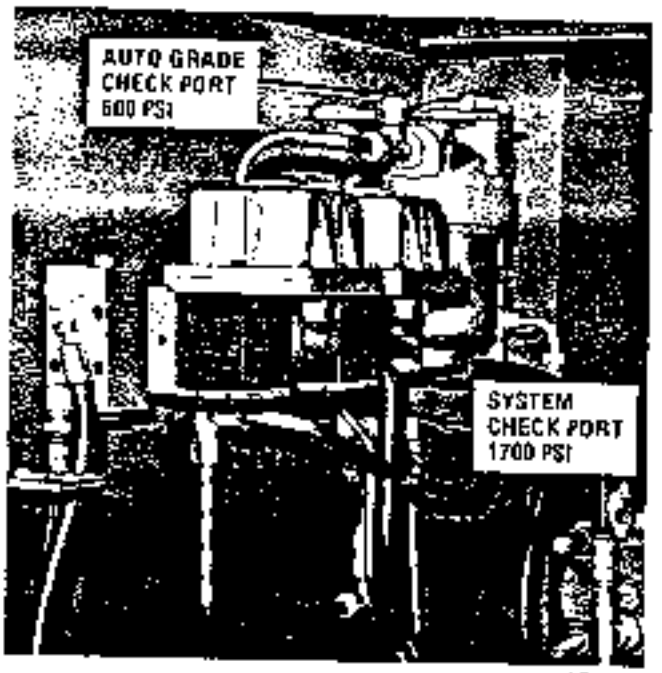

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FIGURE J-65 – Pressure Check Ports

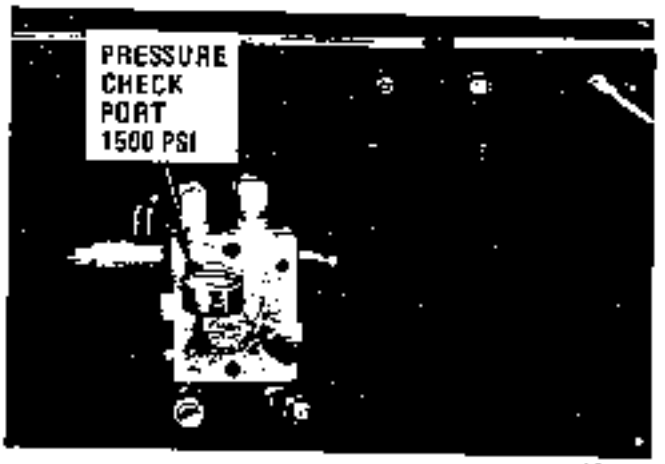

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FIGURE J-66 – Screed Drive Pressure Check Port

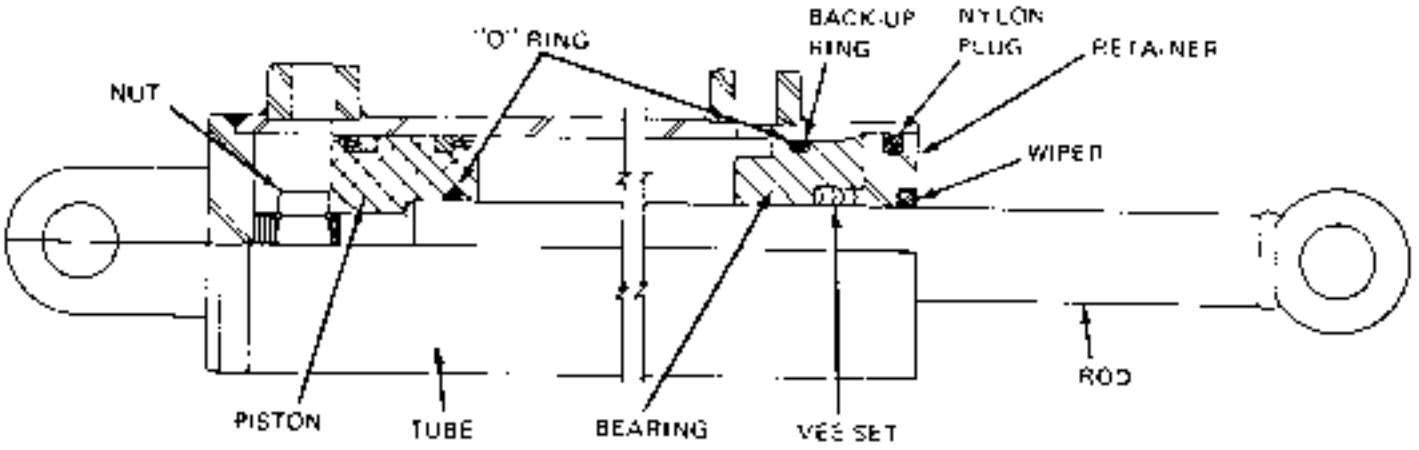

FIGURE J-57 – Hydraulic Cylinder

HYDRAULIC CYLINDER (Refer to Figure J-57)

A sluggish, slow acting cylinder is a good indication of worn or leaking piston packings or seals.

TO INSTALL NEW PACKING SEALS (Refer to Figure J-57)

1. Drain oil from cylinder by turning both oil ports down.
2. Pull piston rod out of cylinder as far as necessary to accommodate the use of a spanner wrench to unscrew the retainer ring.
3. Pull piston rod assembly out of cylinder.

REPLACING SEALS

1. Remove piston rod nut.

CAUTION – Use soft or copper jaws on vise. Piston rod must be protected against damage.

2. Piston, spacer (if any), bearing and retainer can be removed from piston rod.
3. The cylinder body, piston and rod should be examined for evidence of wearing (very light scratch marks are often present on the cylinder body and piston and will generally cause no difficulty).
4. Remove the old seals and clean parts.
5. Install new seals. Refer to Parts Manual for Seal Replacement Kit.

NOTE – Lubricate all seals before installation.

TO ASSEMBLE:

1. Replace retainer, bearing (spacer, if any), piston and piston nut.
2. Push piston rod assembly into cylinder and screw in retainer with spanner wrench. The retainer should be seated firmly. The seals themselves are not adjustable, so no further adjustments are required.
3. If practical, it is suggested to pressurize the cylinder to 1500 – 2000 PSI before installation upon the machine to assure there are no leaks from cut seals caused by assembly.

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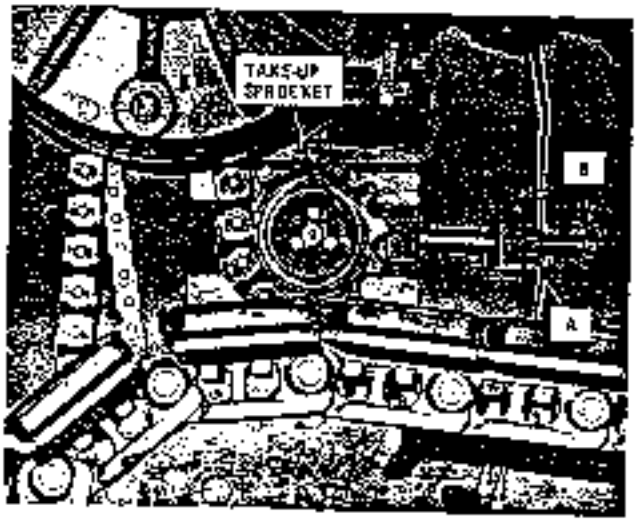
MAINTENANCE AND ADJUSTMENTS



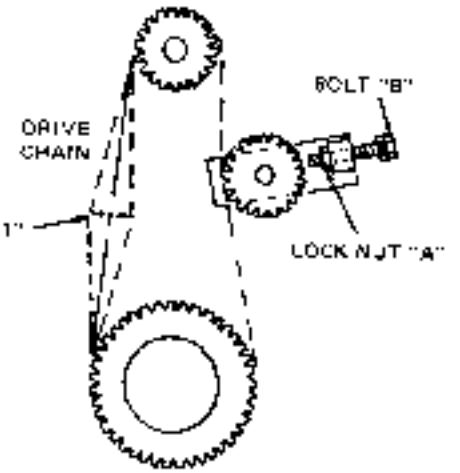


FIGURE K-1 – Crawler Drive Chain Adjustment

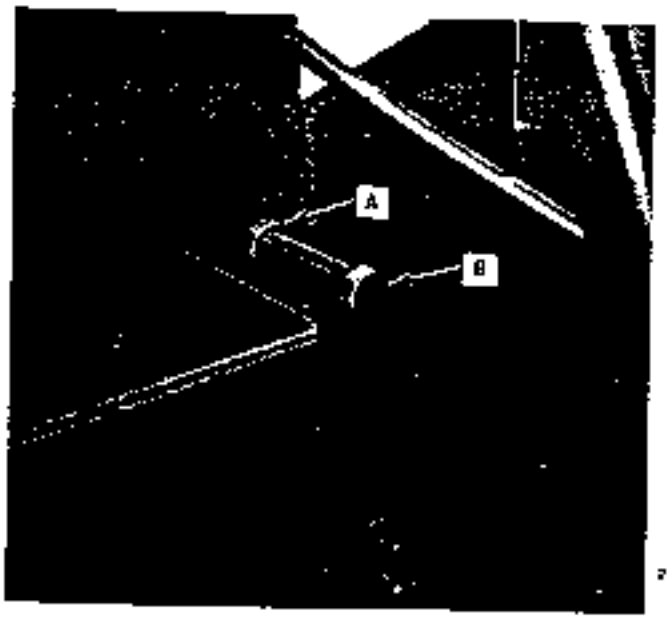
CHAIN ADJUSTMENT

Take up and dead idlers are provided to make the chain adjustments listed below.

The amount of chain slack is indicated by the total amount of movement possible at the mid point of the chain span. The measurement is made on one span, while the other is held tight. If any chain has stretched beyond the point of adjusting, remove a link.

CRAWLER DRIVE CHAIN

There are two crawler drive chains, one on each side. They are adjusted by an idler sprocket. Figure K-1.



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TO ADJUST CHAIN:

1. Loosen lock nut A.
2. Adjust bolt B until there is a maximum of 1" slack.
3. Tighten lock nut A.

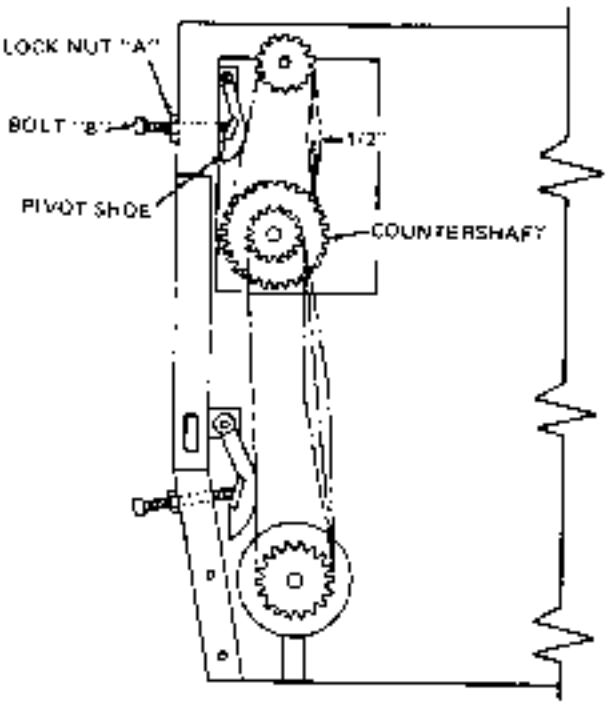


FIGURE K-2 – Feeder Countershaft Drive Chain Adjustment

FEEDER COUNTERSHAFT DRIVE CHAIN (Refer to Figure K-2)

There are two feeder countershaft drive chains on the machine that run from the sprocket on the hydraulic motors to the counter shaft sprockets.

To Adjust Countershaft Drive Chains:

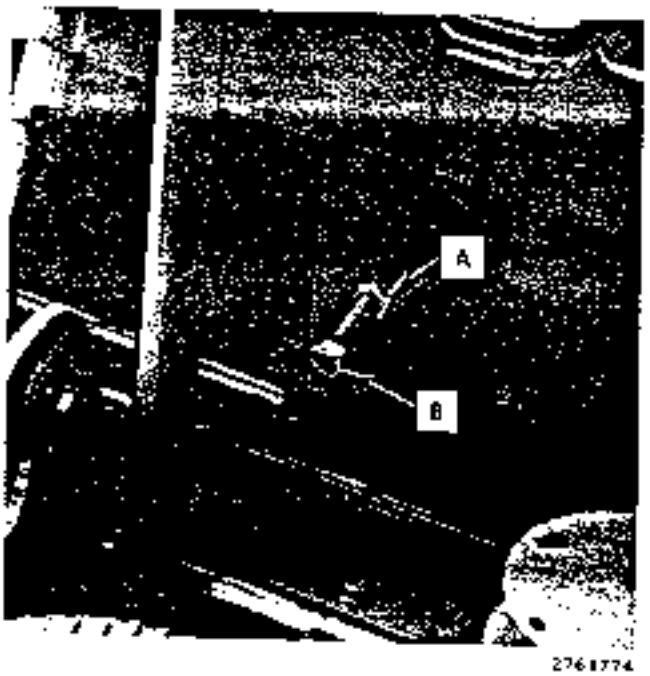
1. Loosen lock nut "A".
2. Adjust take-up bolt "B" until there is 1/2" of movement of chain at the mid point of the return span.
3. Tighten lock nut "A".
4. Repeat this procedure on opposite side of machine.

BAR FEEDER DRIVE CHAINS (Refer to Figure K-3)

There are two feeder drive chains on the machine that run from the outboard countershaft sprocket to the feeder head shaft sprockets.

To Adjust Feeder Drive Chains:

1. Loosen lock nut "A".



2. Adjust take-up bolt "B" until there is 1/2" of movement in the chain at the mid point of the return span.
3. Tighten lock nut "A".
4. Repeat this procedure on opposite side of machine.

SCREW CONVEYOR DRIVE CHAINS (Refer to Figure K-4)

There are two screw conveyor drive chains on the machine that run from the inboard sprockets of the countershaft to the screw conveyor drive sprockets.

To Adjust Screw Conveyor Drive Chains:

1. Loosen lock nut "A".
2. Tighten bolt "B" until there is 1/2" of movement in the chain at the mid point of the return span.
3. Tighten lock nut "A".
4. Repeat this procedure on opposite side of drive chain enclosement.

BAR FEEDER CHAINS (Refer to Figure K-5)

The bar feeder chains are adjusted by four take-up bolts, two for each feeder located in the box at the front of the hopper.

The bar feeder chains should be adjusted so there is very little slack on the return run bars under the hopper. This is desirable to reduce wear on the bars and to prevent chain from climbing over the teeth on the drive sprockets.

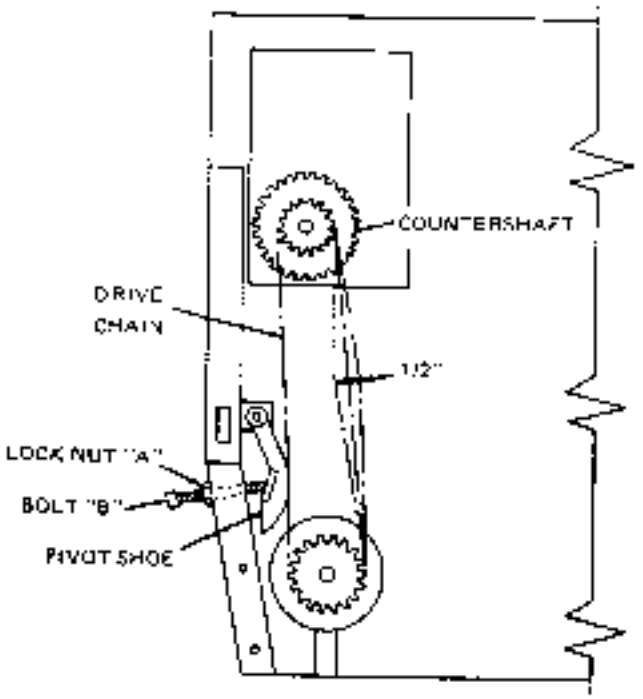


FIGURE K-3 – Feeder Drive Chain Adjustment

TO ADJUST CHAIN:

1. Lift front hopper plate to provide access to the take-ups.
2. Remove cotter pins and holding rod.
3. Adjust both take-ups (A) evenly.
4. Replace holding rod and cotter pins.
5. Repeat the same procedure for the other bar feeder chains.

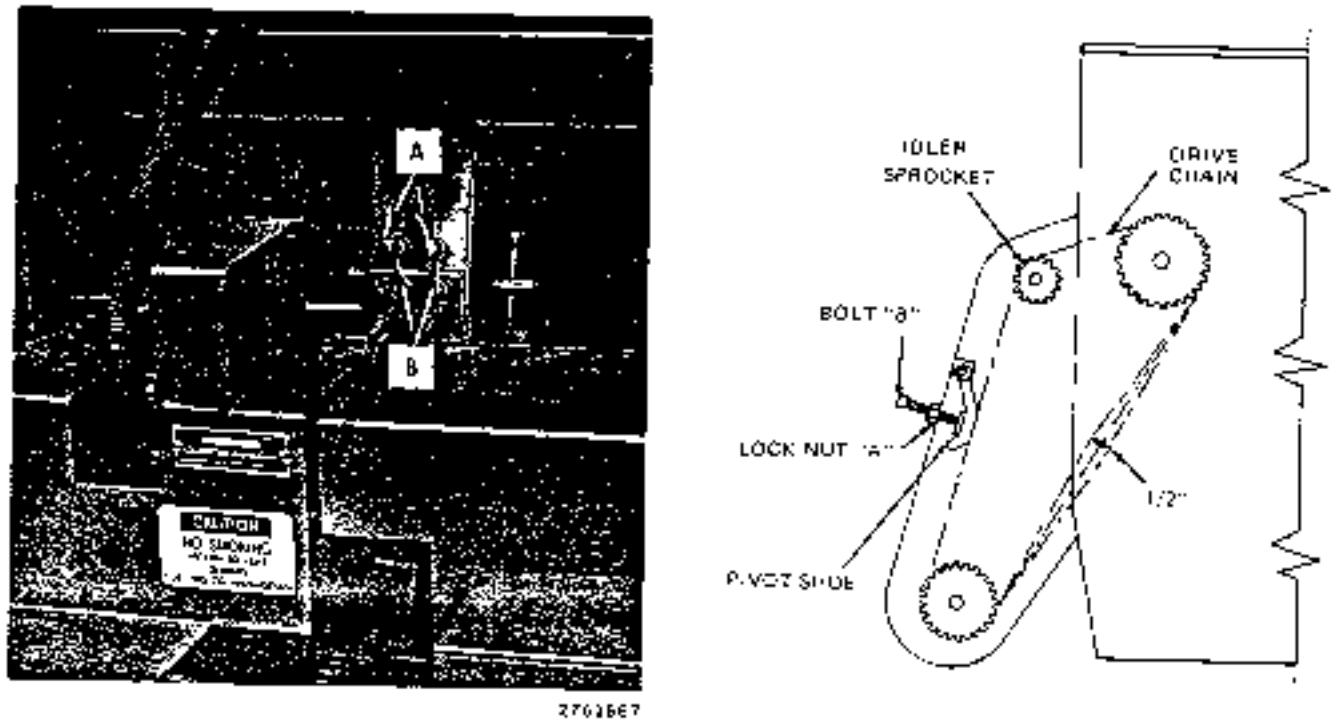


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FIGURE K-4 – Screw Conveyor Drive Chain Adjustment

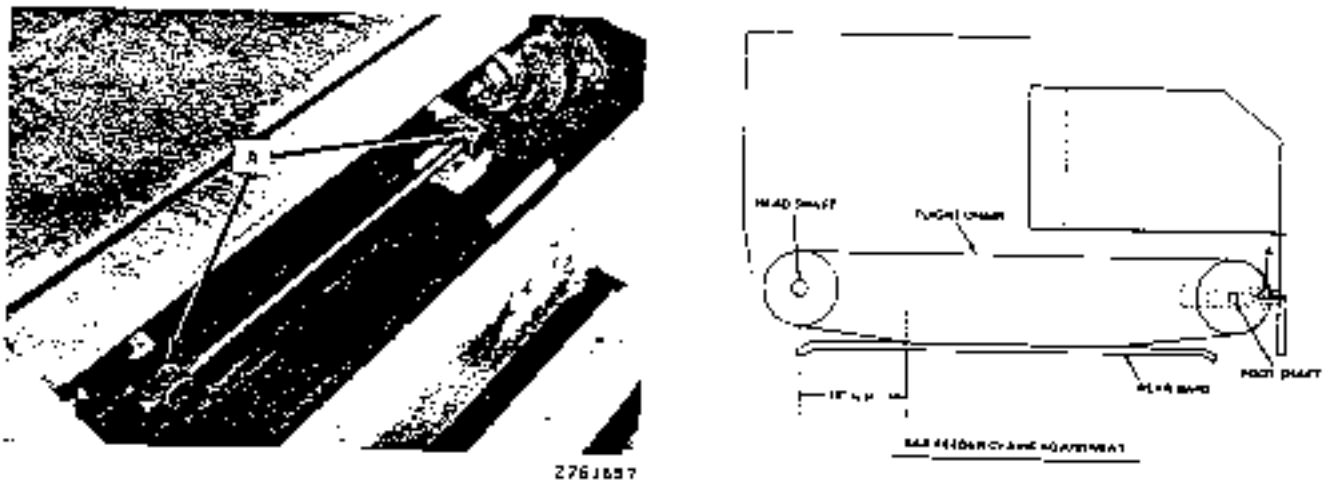

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FIGURE K-5 – Bar Feeder Chains Adjustment

MECHANICAL PARKING BRAKE

The mechanical parking brake, located between operating stations, locks the transmission brake when the engine is not operating. Adjustment is made by turning the knob on the parking brake lever. Turn knob until the handle will lock itself into position when the lever is pulled up.

CRAWLER TAKE-UP

The tracks should be adjusted so they just touch the top of the two rollers on the center angle.

The tracks are adjusted by a grease ram at the take-up idler.

CAUTION: To relieve pressure from the grease ram, back out grease fitting slightly until pressure bleeds off. DO NOT back fitting all the way out until pressure is relieved. 1-1/16" deep well socket required on grease relief.

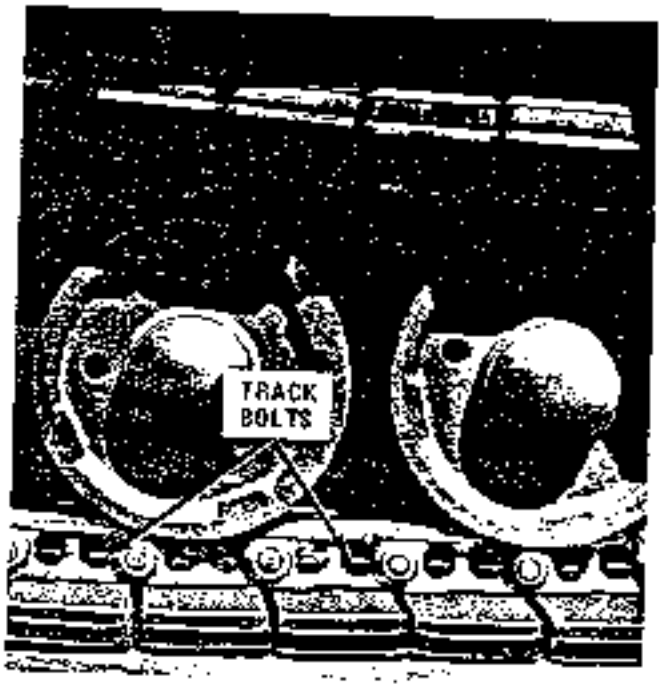

FIGURE K-6 – Crawler Track Bolts

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CRAWLER TRACK BOLTS (Refer to Figure K-6)

NOTE: Check track bolt torque every 100 hours. Track bolt torque - 101-122 ft. lbs.

NOTE: Track bolts have Loctite applied.

Track pad bolt torque - 100-110 ft. lbs.

FEEDER STROKE ADJUSTMENT (Refer to Figure K-7)

Stroke Adjustment Procedure

1. With feeder switch in OFF position, turn clevis (A) 1 turn CW past the position where the feeders stop
2. Run feeders at full speed and count flight bars to ensure that maximum speed, 97 bars per minute, has been achieved.
3. After above adjustment, make following check.
   a. Place volt meter across SLI valve
   b. Turn pot till meter reads 8 volts.
   c. Count for 97 bars per minute.

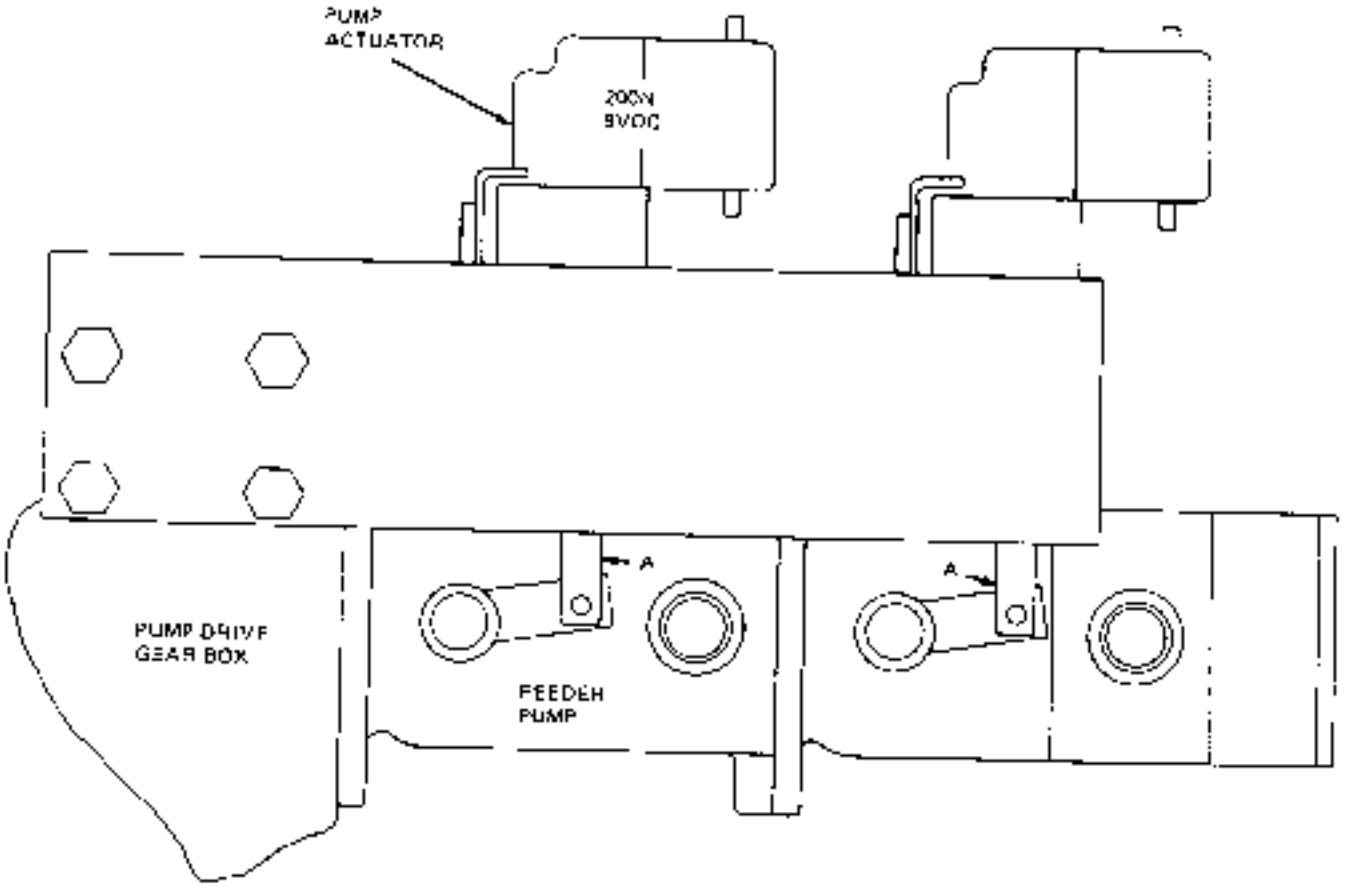

FIGURE K-7 – Hydrostatic Feeder Stroke Adjustment

INDEX

LAYTON HITCH

OPERATION (Refer to Figure L-1)

1. Move the toggle switch to the OPEN position with the finisher running and leave the switch in this position until you receive a truck.
2. When the truck backs into the finisher, move the toggle switch to the CLOSE position until you are ready to release the truck. Then repeat step 1.

HYDRAULIC (Refer to Figure L-2)

Hydraulic pressure, for the hitch system, is supplied by the SBS system on the finisher. The inlet line runs from the main relief valve, on the return manifold, to the hitch solenoid valve. Main relief valve pressure (2000 PSI).

ELECTRICAL (Refer to Figure L-4)

Electrical power, for the operation of the hitch solenoid, is taken from the right feeder gate switch in the operators control stations. The system is protected by the Feeder Gate Circuit Breaker

SERVICE

For service and repairs of the Layton Hitch refer to manufacturers manual furnished in addition to this manual.

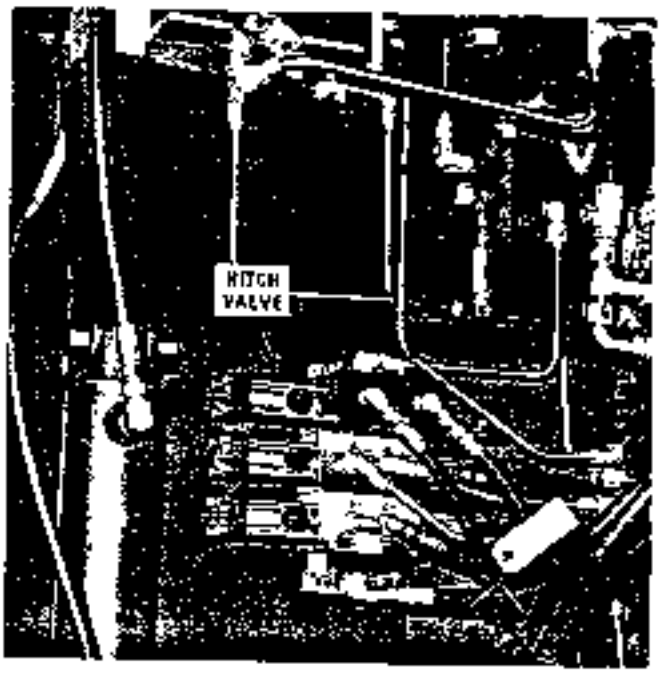

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FIGURE L-1 – Hitch Valve

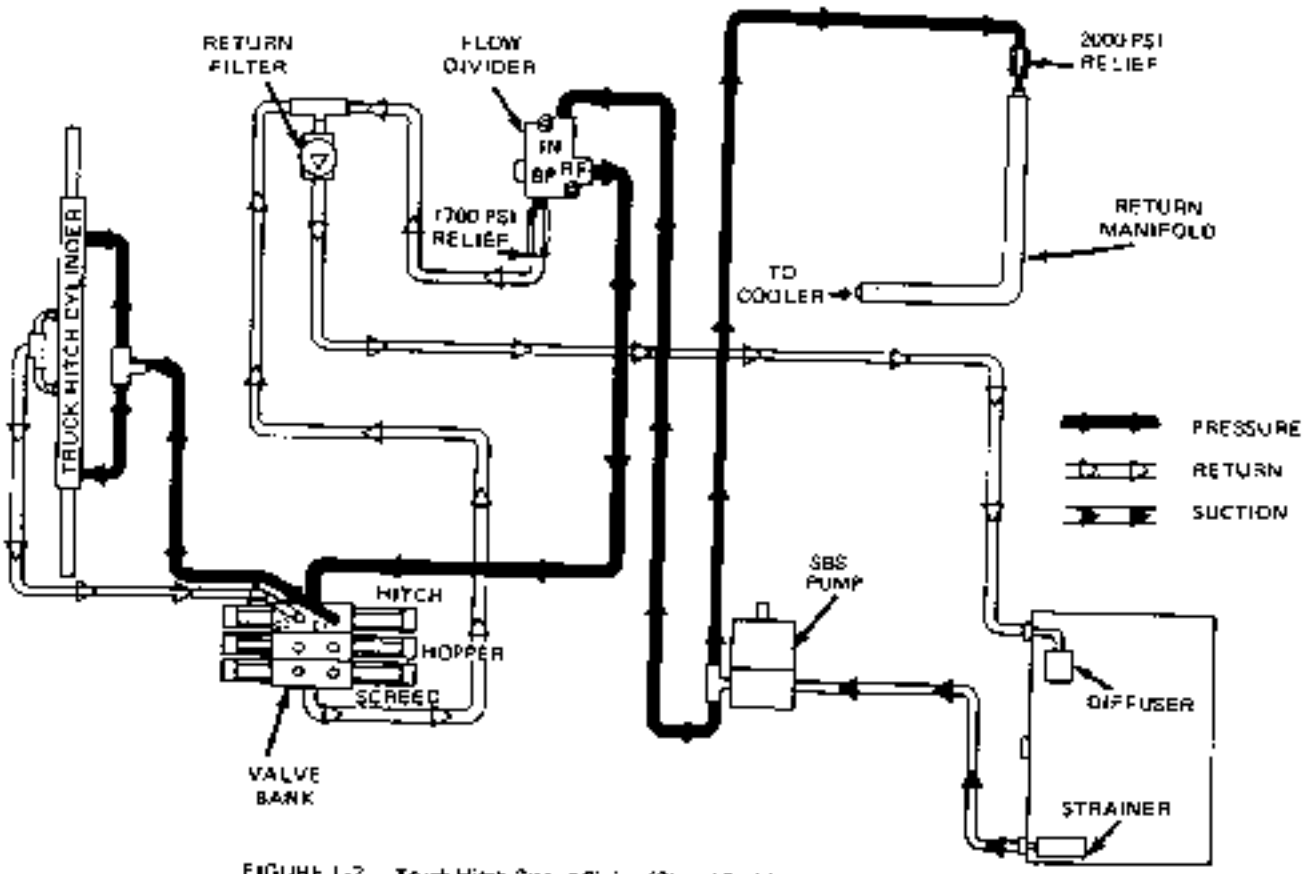

FIGURE L-2 – Truck Hitch Circuit Piping (Closed Position)

FIELD INSTALLATION INSTRUCTIONS

1. Disconnect pressure outlet "T" at basket solenoid valve.
2. Install fittings connecting basket valve and hitch valve. (Refer to Figure L-2).
3. Install pressure inlet "T" and lines to hitch valve. (Refer to Figure L-1).
4. Bolt down hitch valve.
5. Install tubing running from bracket alongside hydraulic tank to bracket below tank. (Refer to Figure L-3).

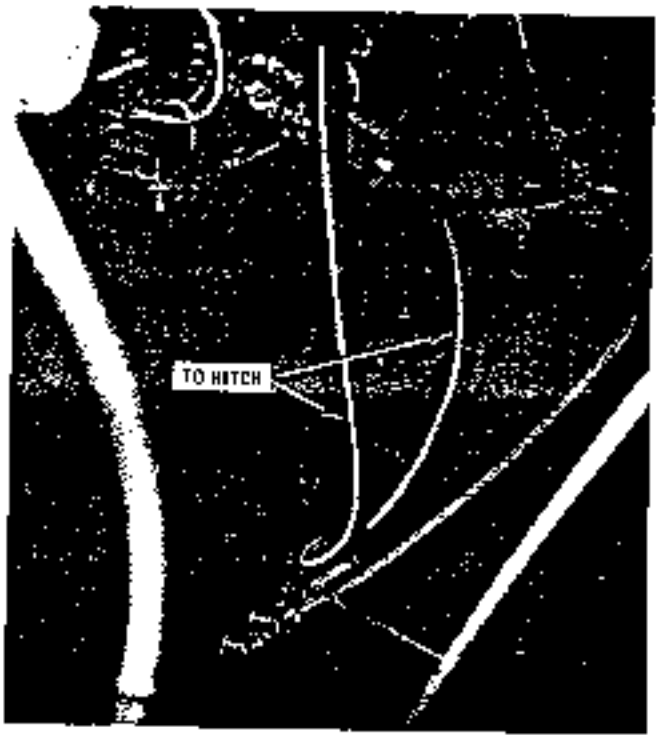

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FIGURE L-3 – Hitch Lines

6. Install hoses from hitch valve to tubing.
7. Weld hydraulic fitting plate over hole at front of main frame. (Refer to Figure L-4).
8. Install hoses from tubing under hydraulic tank to fittings at front of machine. (Refer to Figures L-5 and L-6 for routing)
9. Remove push roller assembly from front of finisher.
10. Bolt hitch beam and slide guide extensions to front of finisher. (Refer to Figure L-7).
11. Install hopper extensions and weld apron extensions to existing apron. (Refer to Figure L-8).

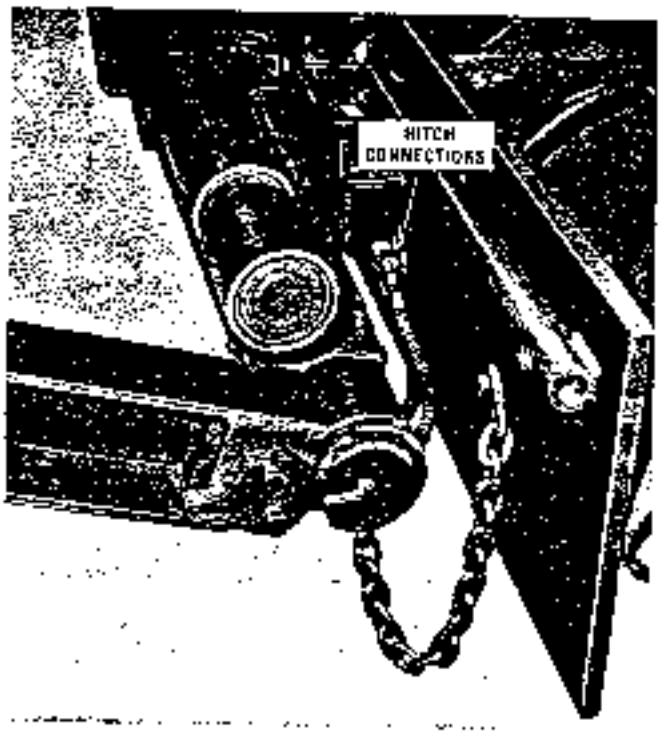

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FIGURE L-4 – Hitch Connections

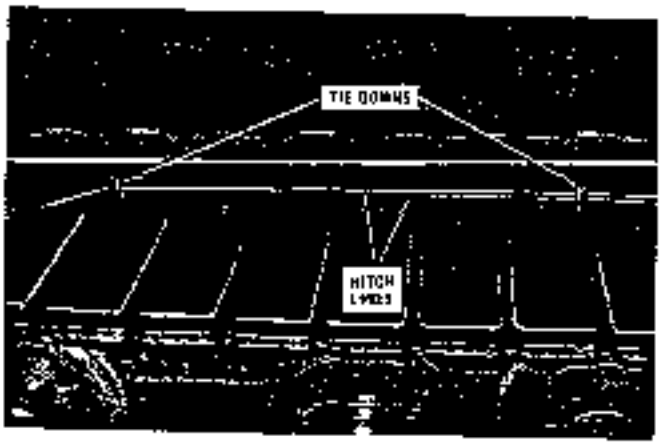

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FIGURE L-5 Hydraulic Lines

ELECTRICAL INSTALLATION (Refer to Electrical Drawing)

Finishers are pre wired and will only require the following work:

1. Connect wires to solenoids.
2. Remove plug for switch, install switch and connect wires.

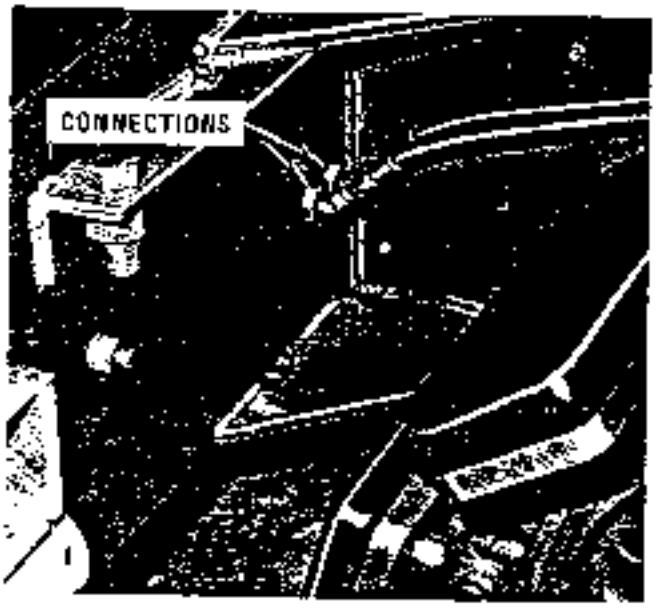

FIGURE L-6 – Hydraulic Connections

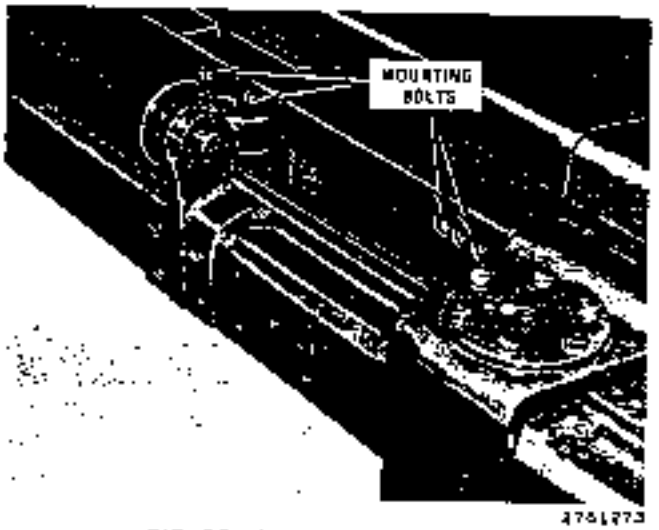

FIGURE L-7 – Beam Installation

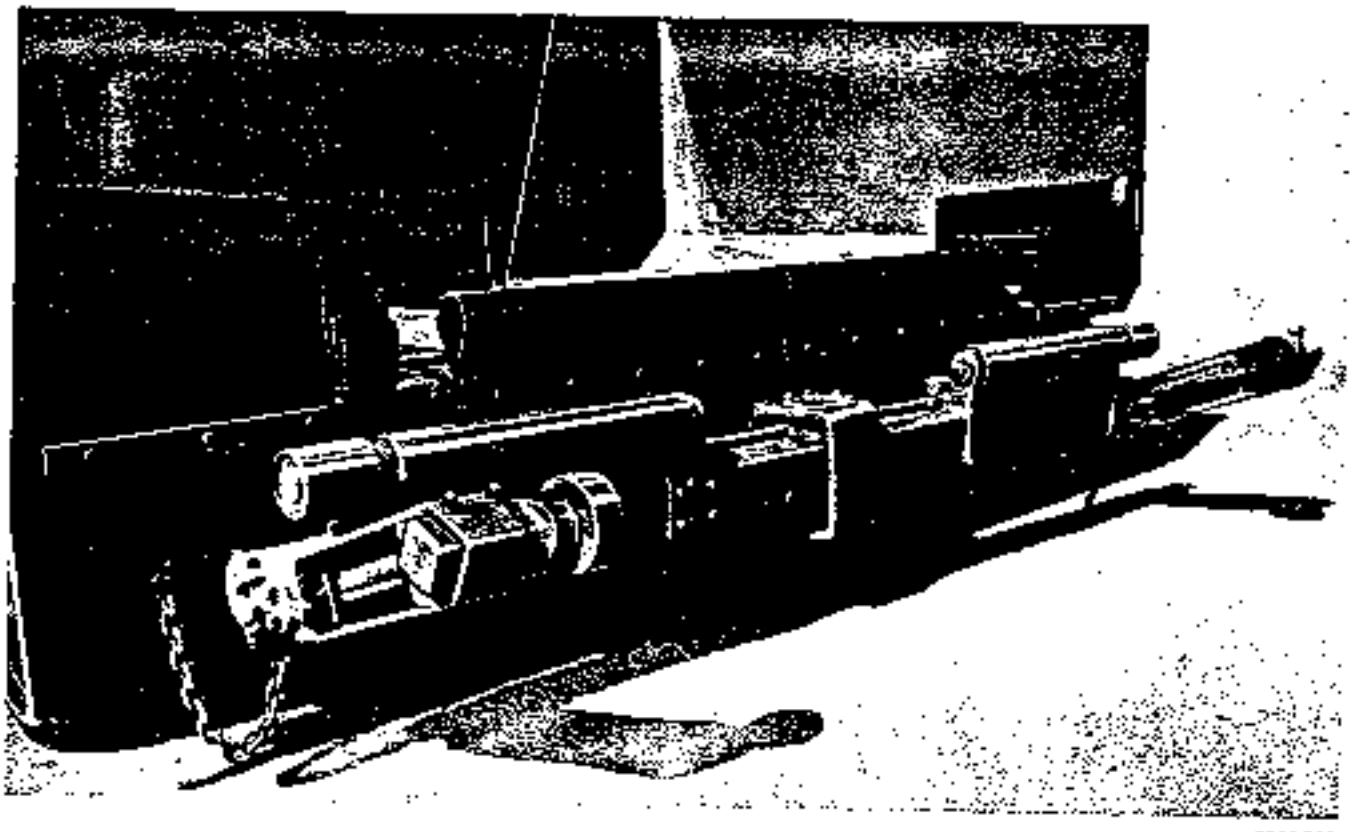

FIGURE L-8 – Hitch Assembly

TROUBLE SHOOTING GUIDE

TROUBLE	POSSIBLE CAUSES	REMEDY
Hitch will not operate in either direction with switch actuated.	A. Defective Solenoid Valve or Main Relief Valve	1. Operate mechanical actuator on Solenoid Valve. If hitch operates, problem is electrical. 2. If system does not operate, check main relief valve. Should read 2000 PSI under load. If relief valve checks OK, replace solenoid valve assembly. If relief valve pressure is not 2000 PSI replace or remove and adjust.
	B. Defective wiring or switches	1. Check circuit breaker. 2. Check for 12 VDC at terminals on solenoid. 3. Check for loose connections at main junction box, switches and solenoids.

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