READ THIS

READ THIS

This revised manual, ISS-1012-Y, "Serviceman's Field Reference for International Diesel Engines and Fuel Injection Systems" replaces ISS-1012-R which should be destroyed.

Future revisions to this manual will be made by individual loose-leaf pages.

SERVICE PUBLICATIONS SECTION
CONSTRUCTION EQUIPMENT DIVISION
INTERNATIONAL HARVESTER COMPANY
MELROSE PARK, ILLINOIS
March, 1961

Printed in United States of America

SERVICEMAN'S FIELD REFERENCE

FOR

DIESEL ENGINES AND FUEL INJECTION SYSTEMS

INTRODUCTION

This "SERVICEMAN'S FIELD REFERENCE" provides the Distributor's Serviceman in the field with a fast, convenient reference for checking the performance of IH diesel engines and diesel fuel systems.

The proper method for checking a diesel engine and its fuel injection system is to do so in a systematic way by starting with the most frequent causes of failure which, incidentally are the easiest to correct, and to eliminate them; then proceed to the causes more difficult to correct, eliminating one cause of failure at a time, until the entire system has been checked.

The information in this manual is arranged in step-by-step sequence. In order to save time, follow the order of the steps as recommended. Steps are illustrated, whenever possible, so the serviceman can see the correct procedure at a glance with the least amount of reading. Written instructions are kept to a minimum.

For detailed instructions for any of the steps, refer to the latest IH Diesel Injection Pump Service Manual, ISS-1003, or to the specific Engine Service Manual.

CONTENTS

TOOLS REQUIRED FOR CHECKING ENGINE IN FIELD AND REPLACING UNITS

Portable Nozzle Tester, Bacharach No. 65-905 D or Kiene KTP-50

Tester Fitting Adapter, 817 C (Kiene)

Compression Gauge, K-120 Kiene, or Motorite

Feeler Gauge, Standard

Scale for making field setting, 1 020 178 R1

Tachometer, PT-3 Sun, or Allen 27-03

0 to 100 lb. Fuel Pressure Gauge

Hi-Idle Gap Gauge Set, 1 020 121 R91 and 1 020 326 R91

Delivery Test Fixture, 1 020 080 R91 (2 required)

IH Tools, SE-1330-1, SE-1330-6, and SE-1330-17B

Injection Nozzle Puller, 1 020 284 R91

Pre-cup Puller, 1 020 310 R91

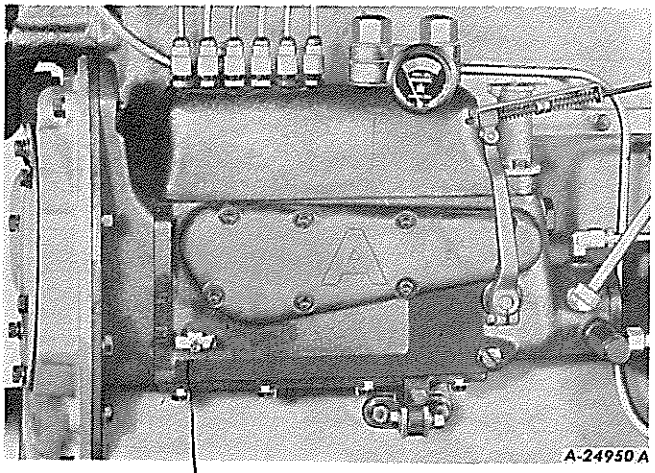
Mechanic's Hand Tools

Gaskets, Seals, and Line Ferrules

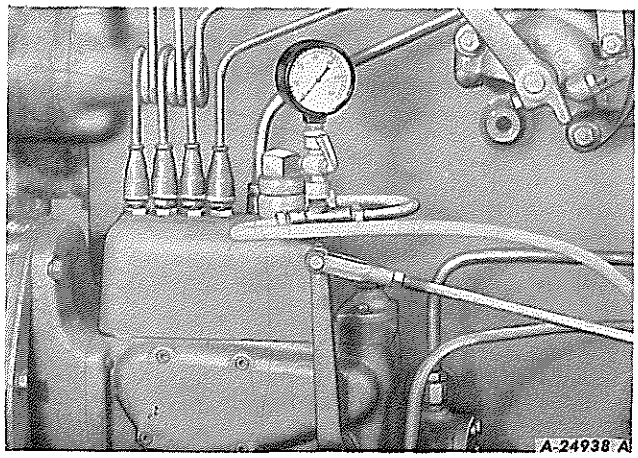
FUEL SYSTEM

STEP 1

Check the primary pump fuel pressure. This should be 58 to 66 pounds at engine speeds of 700 rpm and up.



Pumps Equipped with Fuel Pressure Gauge

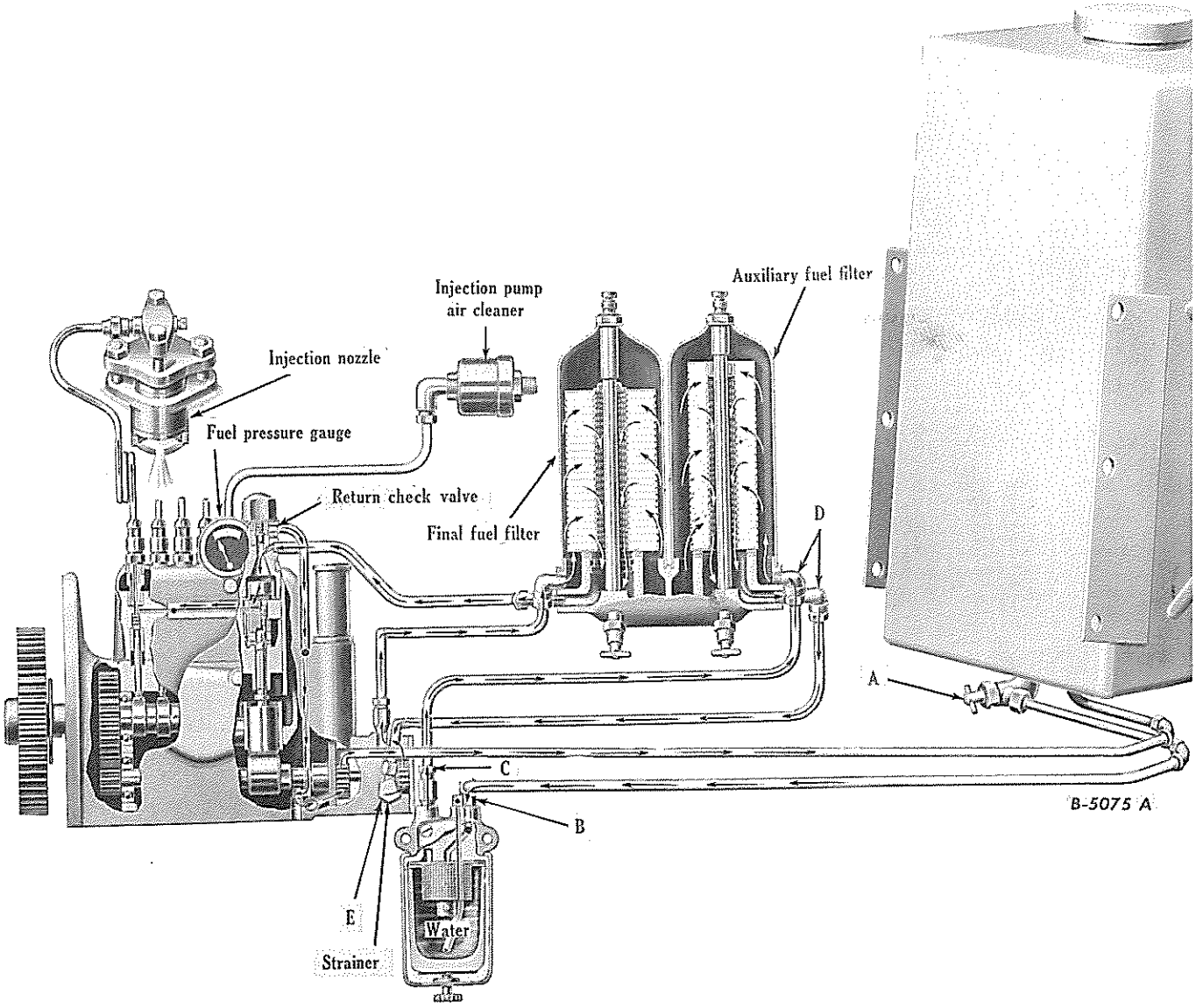


On Pumps Not Equipped with Fuel Pressure Gauge - Use a 0 to 100 pound gauge with plastic tubing and fittings as shown.

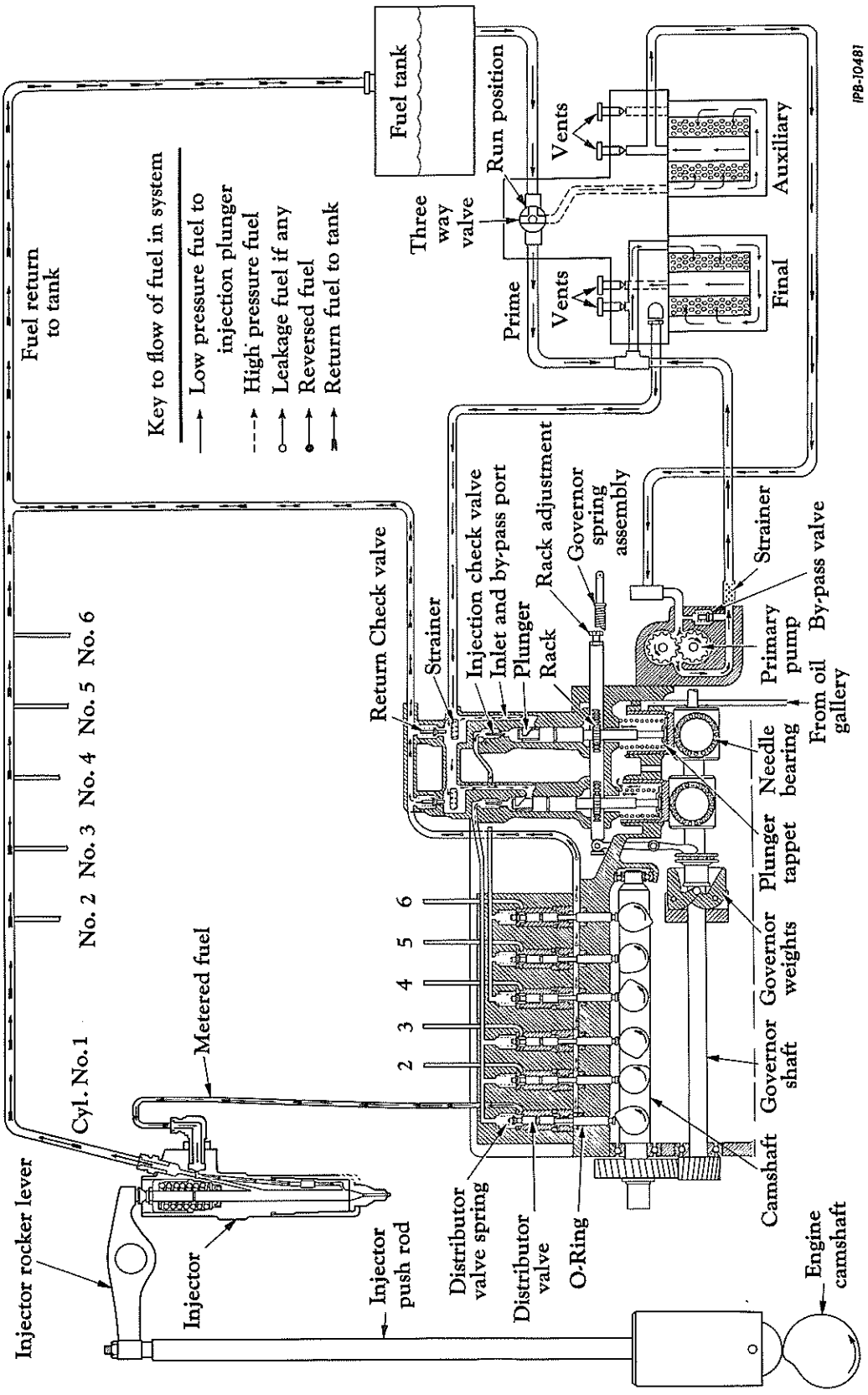
PRINTED IN UNITED STATES OF AMERICA

STEP 2

Check the fuel filtering system. Be sure that the fuel flows freely to the primary pump inlet and that there are no air leaks. Check at points A, B, C, etc., consecutively.



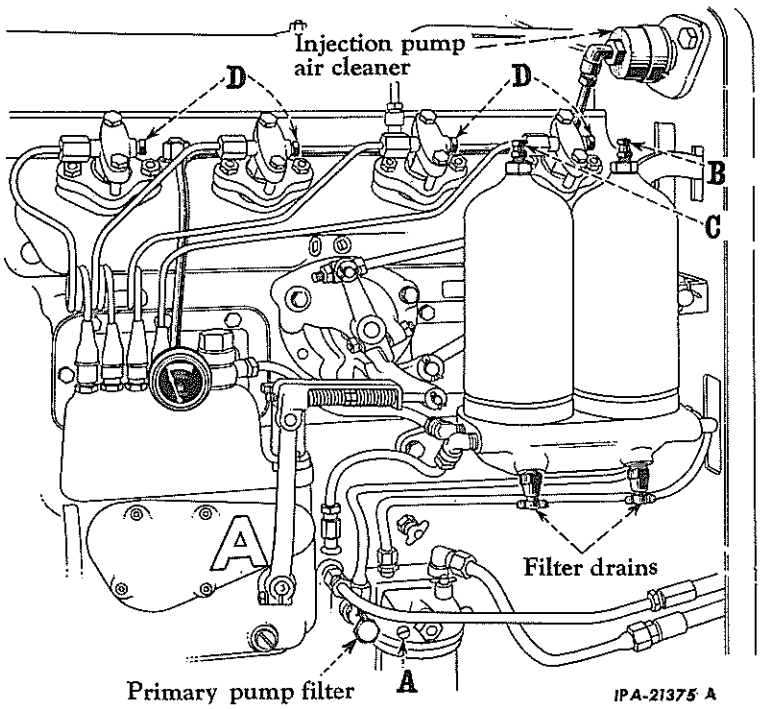
Diesel Fuel System of "9" Series ("A" Pump).
(Others are similar.)



Schematic Diagram of Fuel System (817 Series Diesel Engine - Payhaulers Shown).

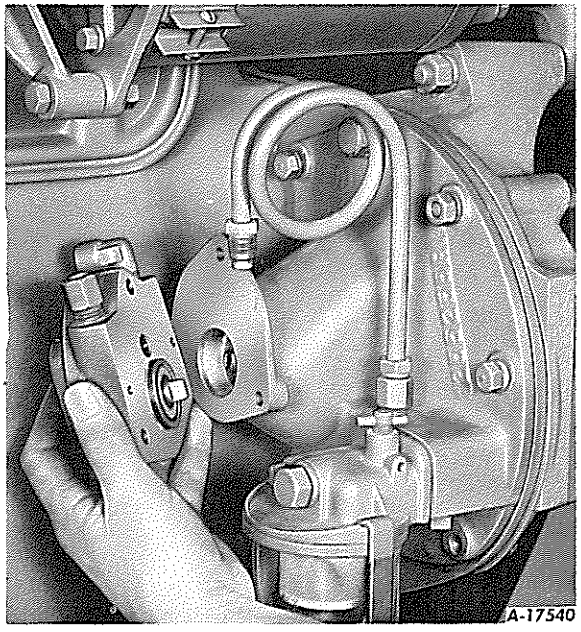
STEP 3

Vent the diesel fuel system. Vent the points A, B, C and D consecutively. Points C and D should be vented with the engine running on the gasoline cycle. At point D, air generally can be vented by sudden acceleration of the engine. If the engine still runs erratically, loosen the screw slightly until the air is expelled.



STEP 4 (Power Units Only)

Check the fuel transfer pump.



STEP 5

Check the air cleaner, and the connections between the manifold and air cleaner, for possible leaks. Clean the oil cup on the air cleaner and the screen on the air intake cap. (Refer to Operator's Manual.)

COMPRESSION RELEASE MECHANISM AND VALVE ADJUSTMENT

ADJUSTMENT

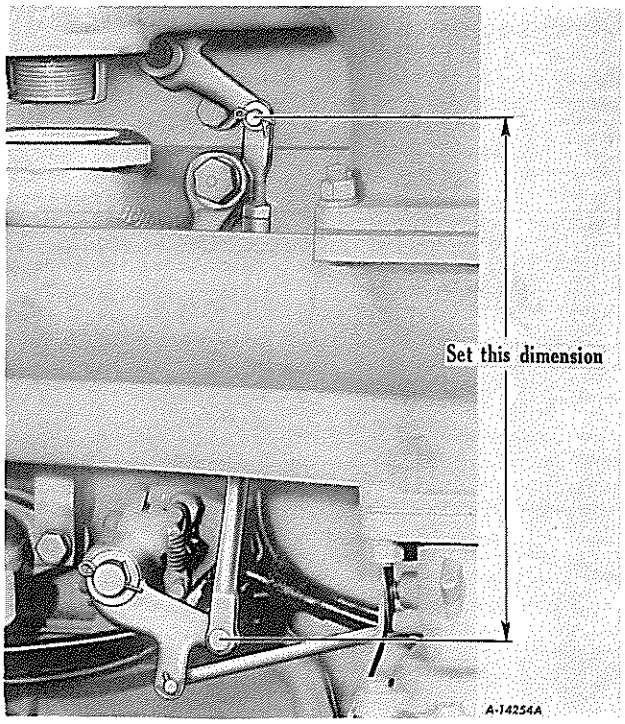
Before the following adjustments are made, the engine must be completely assembled, except for the intake and exhaust manifolds. All rods and linkage should be lubricated.

WITH MECHANISM IN DIESEL POSITION

STEP 6 (All Series)

Adjust the length of the operating rod.

Engine Series	Dimensions
6 and 6A	6-7/16"
264 and 281	6-5/16"
9, 9A, 350 and 370	6-29/32"
14, 14A, 18A and 691	9-7/16"
18	9-9/32"
16, 525 and 554	6-25/32"
24	8-1/2"

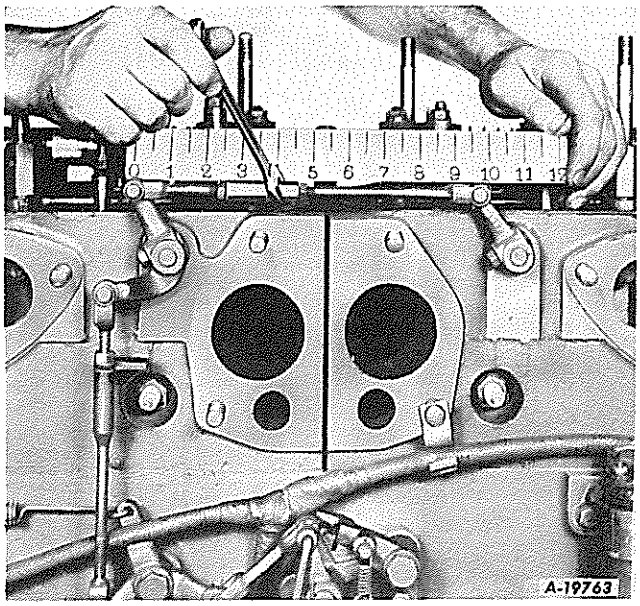


PRINTED IN UNITED STATES OF AMERICA

STEP 7 (16, 525, 554, 24 and 1091 Series Only)

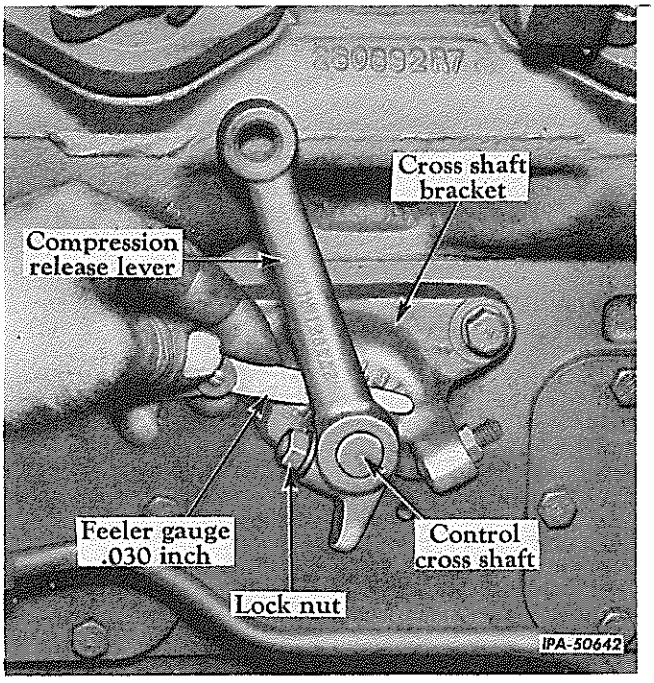
Adjust the starting valve cross shaft lever rod.

Engine Series	Dimensions
16, 525 and 554	7-1/4"
24 and 1091	9-23/32"



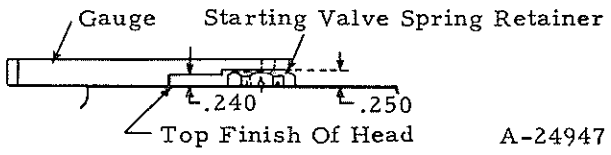
STEP 8 (All Series Except 817)

Check and adjust the cross shaft end play.



STEP 9 (18 Series Only)

Check all six starting valve spring retainers, as shown.

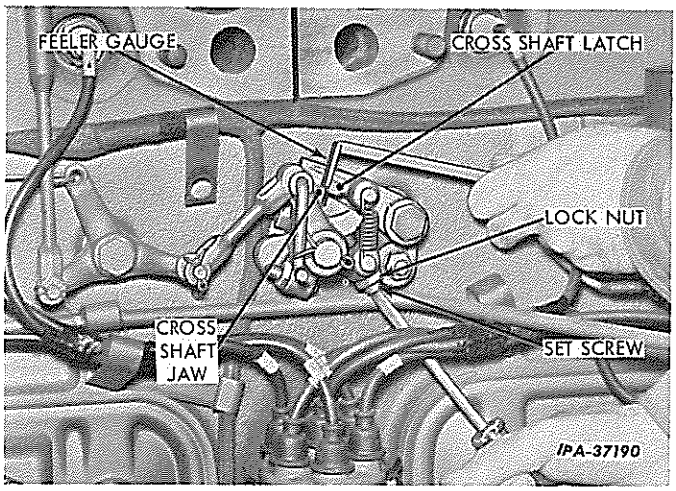


Continued on next page.

WITH MECHANISM IN DIESEL POSITION – Continued

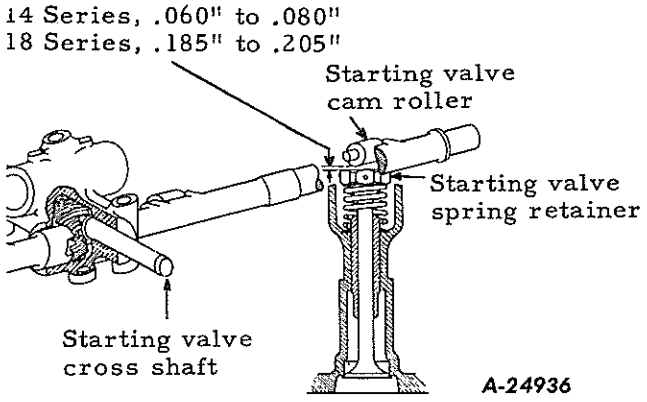
STEP 10 (All Series Except 817)

Check and adjust the clearance between the cross shaft latch and the cross shaft jaw.



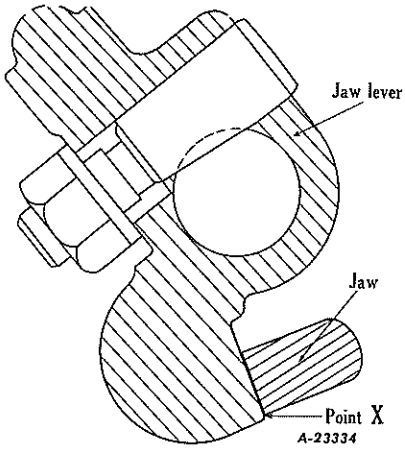
STEP 11 (14 and 18 Series Only)

Adjust the clearance between the starting valve shaft cam (or cam roller) and the starting valve cover (spring retainer).

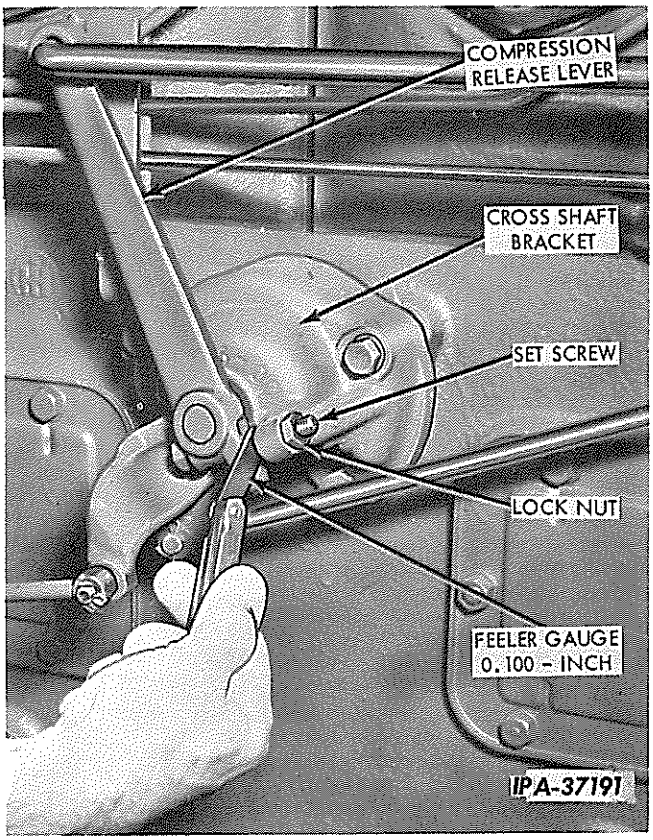


PRINTED IN UNITED STATES OF AMERICA

STEP 12 (All Series Except 817)

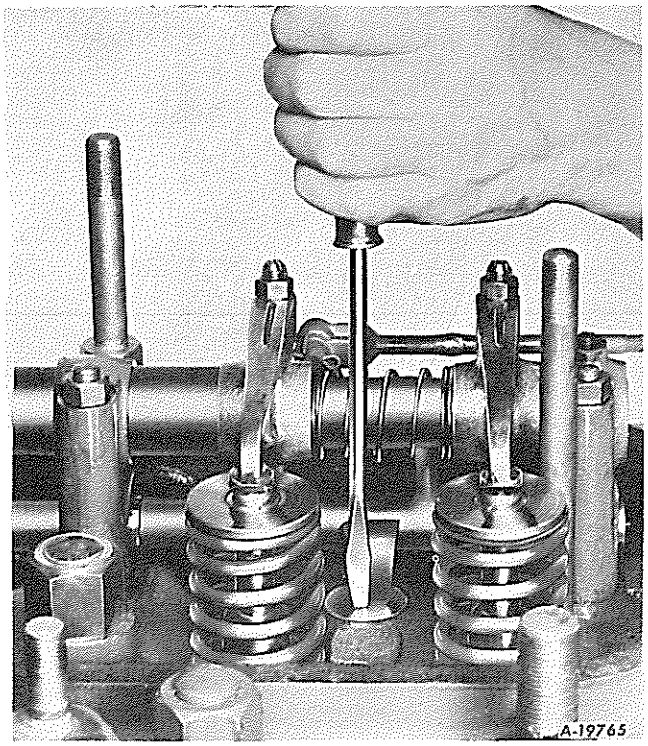


With mechanism in diesel position, turn cross shaft release lever clockwise until jaw and jaw lever contact at point "X".



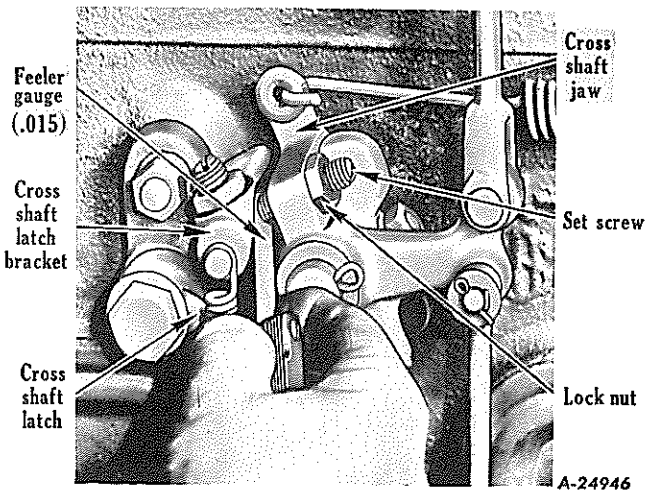
STEP 13 (All Series Except 817)

With controls in gasoline position, check the starting valve cover travel. This should be approximately 1/64 inch before bottoming in the cylinder head.



STEP 14 (All Series Except 817)

With controls in gasoline position, check and adjust the clearance between the set screw in the cross shaft jaw and the latch bracket (.015 inch).



STEP 15 (All Series Except 817)

With controls in gasoline position, check to see that each starting valve cover has additional travel (refer to Step 13). If check shows no travel, controls should be rechecked for errors in adjustment.

STEP 16 (All Series Except 817)

With controls in diesel positions check to determine if there is clearance between the starting valve shaft and valve covers.

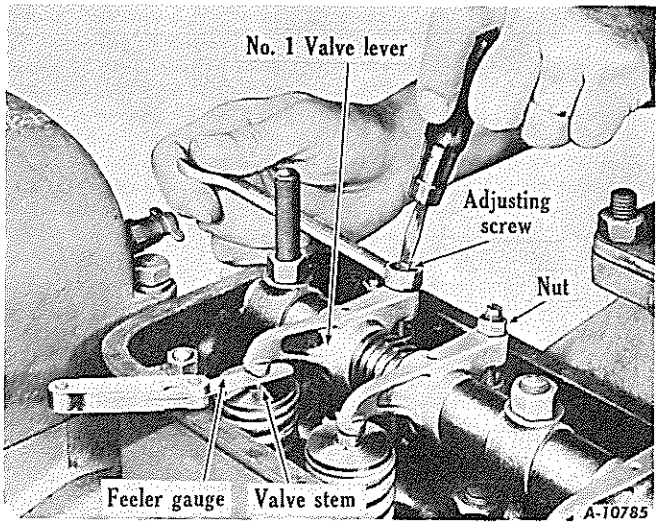
NOTE: Prior to installing the manifolds, check the butterfly valves in the intake manifold to see that they are in a horizontal position. Butterfly valves must fit with not more than .0015 inch clearance, measured with a feeler gauge no wider than 1/8 inch.

STEP 17 (All Series Except 817)

Install the manifolds and set the intake and exhaust valves.

Adjust the valve clearance.

Engine Series	Valve Clearance Intake and Exhaust	
	Hot	Cold
6, 6A, 264, 281, 9, 9A, 350 and 370 . . .	.017"	.019"
14 and 14A	.018"	.020"
16, 525 and 554 . . .	.017"	.019"
UD-18 and UD-18A . .	.017"	.019"
TD-18, TD-18A and 691	.018"	.020"
24	.023"	-
1091.	.023"	-



PRINTED IN UNITED STATES OF AMERICA

TUNE-UP CHART

Model	Firing Order	High Idle Speed R.P.M.	Low Idle Speed R.P.M.	Gasoline Cycle (Starting) R.P.M.	Distributor Point Gap Inch	Magneto Point Gap Inch	Spark Plug Gap Inch
UD-6	1 - 3 - 4 - 2	1635 - 1695	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-6A	1 - 3 - 4 - 2	1745 - 1805	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
IUD-6	1 - 3 - 4 - 2	1580 - 1640	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
TD-6	1 - 3 - 4 - 2	1580 - 1640	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
ID-6	1 - 3 - 4 - 2	1580 - 1640	450 - 550	900 - 1200	-	.013	.023 - .028
TD-6(61)	1 - 3 - 4 - 2	1660 - 1720	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-264	1 - 3 - 4 - 2	1715 - 1775	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-281	1 - 3 - 4 - 2	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-9	1 - 3 - 4 - 2	1635 - 1695	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-9A	1 - 3 - 4 - 2	1745 - 1805	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-350	1 - 3 - 4 - 2	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-370	1 - 3 - 4 - 2	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.013	.023
TD-9	1 - 3 - 4 - 2	1525 - 1585	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
ID-9	1 - 3 - 4 - 2	1635 - 1695	450 - 550	900 - 1200	-	.013	.023 - .028
TD-9(91)	1 - 3 - 4 - 2	1660 - 1720	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-14	1 - 3 - 4 - 2	1470 - 1530	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-14A	1 - 3 - 4 - 2	1525 - 1585	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
TD-14	1 - 3 - 4 - 2	1470 - 1530	450 - 550	900 - 1200	-	.013	.023 - .028
TD-14A	1 - 3 - 4 - 2	1525 - 1585	450 - 550	900 - 1200	-	.013	.023 - .028
TD-14 (141, 142)	1 - 3 - 4 - 2	1495 - 1555	450 - 550	900 - 1200	.019 - .023	.013	.023 - .028
UD-461	1 - 3 - 4 - 2	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.013	.023
UD-16	1-5-3-6-2-4	1965 - 2035	450 - 550	900 - 1200	.019 - .023	.020	.023 - .028
UD-525	1-5-3-6-2-4	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.020	.023 - .028
UD-554	1-5-3-6-2-4	1930 - 1990	450 - 550	900 - 1200	.019 - .023	.020	.023
TD-15 (150)	1-5-3-6-2-4	1770 - 1830	450 - 550	900 - 1200	.020	.020	.023
UD-18	1-5-3-6-2-4	1525 - 1585	450 - 550	900 - 1200	.019 - .023	.020	.023 - .028
UD-18A	1-5-3-6-2-4	1745 - 1805	450 - 550	900 - 1200	.019 - .023	.020	.023 - .028
TD-18	1-5-3-6-2-4	1415 - 1475	450 - 550	900 - 1200	-	.020	.023 - .028
TD-18A	1-5-3-6-2-4	1470 - 1530	450 - 550	900 - 1200	-	.020	.023 - .028
TD-18A (181, 182)	1-5-3-6-2-4	1550 - 1610	450 - 550	900 - 1200	.019 - .023	.020	.023 - .028
UD-691	1-5-3-6-2-4	1715 - 1775	450 - 550	900 - 1200	.020	.020	.023
TD-20	1-5-3-6-2-4	1660 - 1720	450 - 550	900 - 1200	.020	.020	.023
UD-24	1-5-3-6-2-4	1495 - 1555	450 - 550	900 - 1200	.019 - .023	-	.023 - .028
TD-24	1-5-3-6-2-4	1495 - 1555	450 - 550	900 - 1200	.019 - .023	-	.023 - .028
UD-1091	1-5-3-6-2-4	1495 - 1555	450 - 550	900 - 1200	.019 - .023	-	.023 - .028
TD-25 (250)	1-5-3-6-2-4	1605 - 1665	625 - 675	-	-	-	-
PH-65, PH-95, 295 and 495 UD, UDT-817	1-5-3-6-2-4	2205 - 2285	625 - 675	-	-	-	-

TUNE-UP CHART

Model	Valve Clearance		Valve Timing				Nozzle Discharge Pressure		Compression Pressure at 1000 R.P.M. P.S.I.
	Hot Inch	Cold Inch	Intake Opens Degrees	Intake Closes Degrees	Exhaust Opens Degrees	Exhaust Closes Degrees	New Nozzle P.S.I.	Used Nozzle P.S.I.	
UD-6	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	442 - 488
UD-6A	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	556 - 614
IUD-6	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	442 - 488
TD-6	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	556 - 614
ID-6	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	556 - 614
TD-6 (61)	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	500 - 550
UD-264	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	556 - 614
UD-281	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	556 - 614
UD-9	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	446 - 494
UD-9A	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
UD-350	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	500 - 550
UD-370	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
TD-9	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
ID-9	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
TD-9 (91)	.017	.019	10 before TDC	30 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	500 - 550
UD-14	.018	.020	10 before TDC	25 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
*UD-14	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
UD-14A	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
TD-14	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
TD-14A	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
TD-14A (141, 142)	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
UD-461	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
UD-16	.017	.019	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
UD-525	.017	.019	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	500 - 550
UD-554, TD-15 (150)	.017	.019	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	503 - 557
UD-18	.017	.019	10 before TDC	25 after BDC	43 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
*UD-18	.017	.019	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
UD-18A	.017	.019	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
TD-18	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	423 - 467
TD-18A	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
TD-18A (181, 182)	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
UD-691, TD-20	.018	.020	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	513 - 567
UD-24	.023	.025	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	484 - 536
TD-24	.023	.025	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	484 - 536
UD-1091	.023	.025	20 before TDC	40 after BDC	40 before BDC	10 after TDC	740 - 750	690 - 710	490 - 535
UD-817, PH-65 (652)	.011 (I) .031 (E)	.013 (I) .033 (E)	20 before TDC	40 after BDC	45 before BDC	15 after TDC	-	-	495 - 555
UDT-817, TD-25, PH-95, 295 and 495	.011 (I) .031 (E)	.013 (I) .033 (E)	50 before TDC	50 after BDC	30 before BDC	55 after TDC	-	-	495 - 555

* 14 and 18 series engines with new camshafts and valve springs. I - Intake, E - Exhaust

ISS-1012-Y. 3-61.

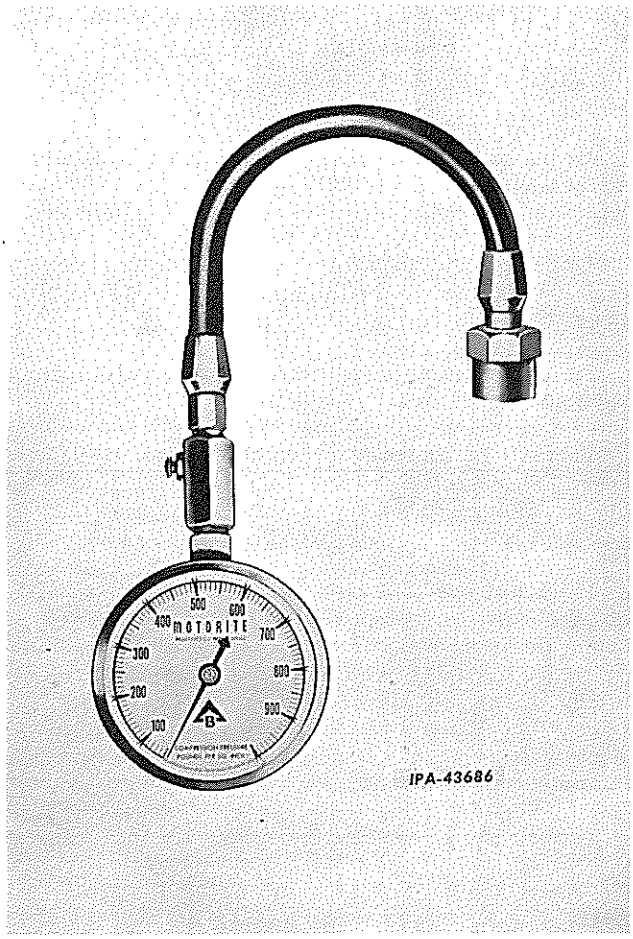
PRINTED IN UNITED STATES OF AMERICA

STEP 18

Check the Diesel Compression Pressure (Except 817 Series Diesel Engines)

Check the compression of each cylinder on the diesel cycle. Remove the No. 1 nozzle body from the cylinder head. Insert either the proper Kiene adapter or Bacharach adapter into position in the cylinder head, and secure in place. Attach Kiene model K-120 or Bacharach pressure indicator 70-955 to the adapter.

Start the engine; then switch to the diesel cycle. With engine operating at 1,000 rpm, check the compression reading on the indicator. (See "TUNE-UP CHART" for compression pressure.) After the above procedure has been completed, remove the adapter, and check the other cylinders in the same manner. Install each nozzle assembly after checking the cylinder.



NOTE: Be sure the compression gauge used is in working order and is free of leaks.

(Continued on next page.)

STEP 18 – Continued

Check the Diesel Compression Pressure (817 Series Diesel Engines)

The engine must be at operating temperature before checking the compression pressure.

1. Remove both valve covers.

2. Hand crank the engine until the exhaust valves for the number six cylinder start to close. The closing of the exhaust valves can be seen plainly by observing the two valves which are furthest to the rear. Continue cranking slowly until the "1 and 6 TDC" mark on the vibration damper is in line with the timing pointer. At this point number one piston is on top-dead-center of the compression stroke.

NOTE: Crank the engine using the cranking motor extended shaft. Refer to Section 10, "Cranking Motor," ISS-1041 Service Manual, for detailed instructions.

3. Continue to crank the engine slowly until the "1 and 6 ADJ" mark is in line with the timing pointer. The engine is now in position to check the compression of the number one cylinder.

4. Remove the number one injector fuel inlet and return lines. Install a jumper line between the inlet and return fittings on the valve housing.

5. Back out the injector lever adjusting screw until it is clear of the injector push rod socket. Move the push rod to the side.

6. Remove the injector hold down crab and remove the injector.

7. Install the adapter from the Kiene K-817 tester (refer to "Service Tool Manual," ISS-1002). Secure the adapter with the injector crab and bolt. Torque the bolt to 30-35 ft-lb.

8. Position the injector push rod under the rocker lever and turn the adjusting screw in until a definite stop is felt. At this point, the spring in the adapter is solid. Back the adjusting screw out two full turns. This will preload the lifter, push rod and rocker lever, which will prevent these parts from bouncing around during the test.

9. Attach the pressure indicator to the adapter.

10. Start the engine and run at 1000 rpm. Check the compression reading on the indica-

Adapter	Engine Used On	Cylinder Head
D-511	UD-9A and TD-9 (91) TD-9 (TDCBM-28500 and up) WD-9 (WDCBM-18001 and up) UD-350, UD-370 UD-14A and TD-14A TD-14A (141), TD-14 (142) and TD-15 (150) UD-16 and UD-461 UD-525, UD-554 UD-18A and TD-18A TD-18A (181), TD-18 (182), UD-691 and TD-20 (200)	45 degree
D-521 Same design as D-511, but slightly smaller	UD-6A TD-6 (TDBKM-21001 and up) WD-6 (WDBKM-7201 and up) Super WD-6 MD (FDBKM-14501 and up) Super MD UD-264, UD-281 TD-6 (61)	45 degree
D-503	UD-6 TD-6 (below TDBKM-21001) WD-6 (below WDBKM-7201) MD (below FDBKM-14501) UD-9 TD-9 (below TDCBM-28500) WD-9 (below WDCBM-18001) UD-14 TD-14 UD-18 TD-18 TD-35 TD-40 ID-WD-40	45 degree
D-506	TD-35 TD-40 PD-40 ID-WD-40 PD-80	10 degree
D-507	TD-40 PD-40 ID-WD-40	Vertical
D-515 Same design as D-511, but slightly larger	UD-24 TD-24 and TD-24 (241) UD-1091	45 degree
K-817	TD-25 (250), UD-817, UDT-817, PH-65 (652), PH-95, 295 and 495	

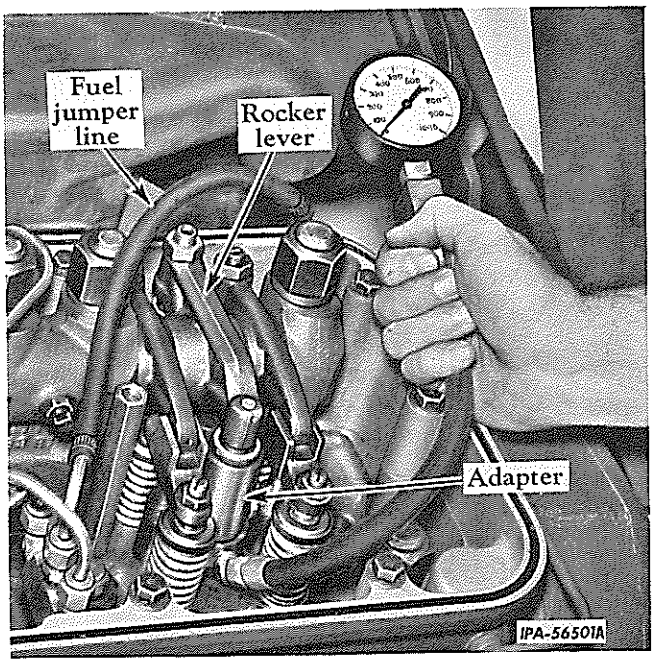
PRINTED IN UNITED STATES OF AMERICA

tor. (Refer to "Tune-up Chart" for compression pressure.)

11. After checking the number one cylinder, remove the adapter and reinstall the injector and fuel lines. Adjust the injector plunger setting as outlined in Section 2, "Manifolds, Cylinder Heads and Valves," in Service Manual ISS-1041.

12. Check the compression of the remaining cylinders in the same manner following the engine firing sequence which is 1-5-3-6-2-4. Two complete revolutions of the crankshaft are needed to check the compression of all cylinders

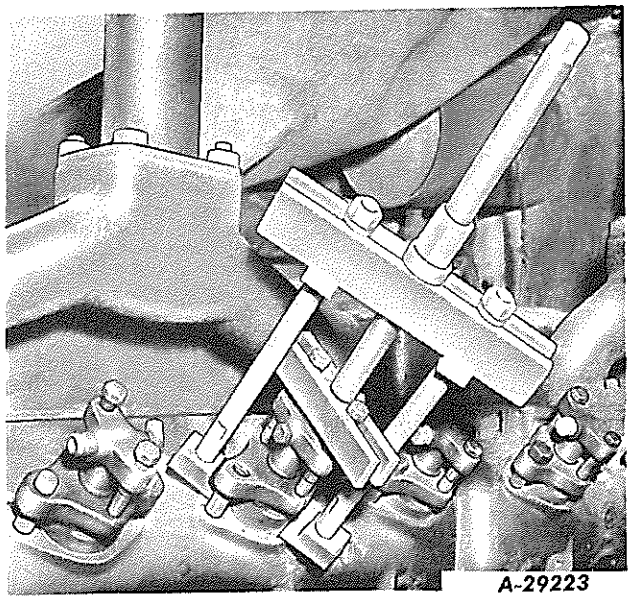
NOTE: Be certain that the compression gauge used is in working order and is free of leaks.



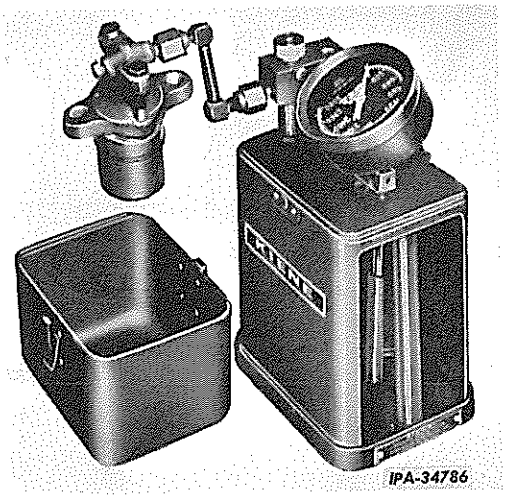
Checking Compression Pressure.
(817 Series Engine)

STEP 19

Remove the injection nozzles and check for leaks and opening pressure.



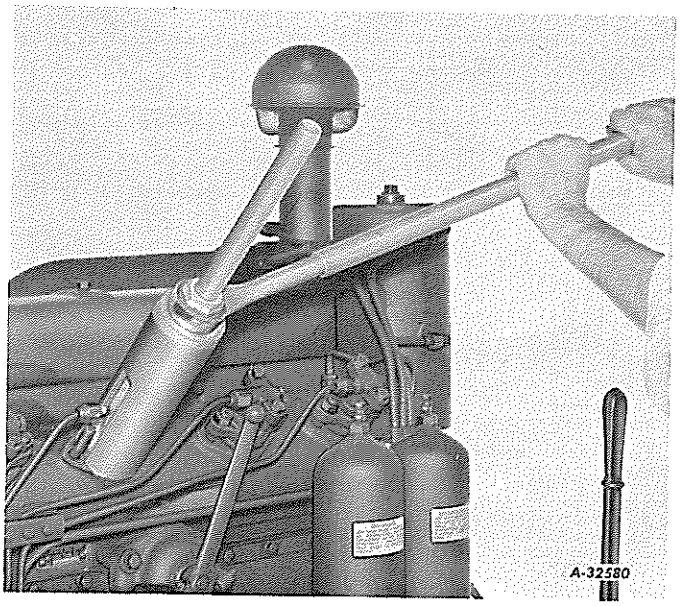
Remove Nozzle
(Use Injection Nozzle Puller 1 020 284 R91.)



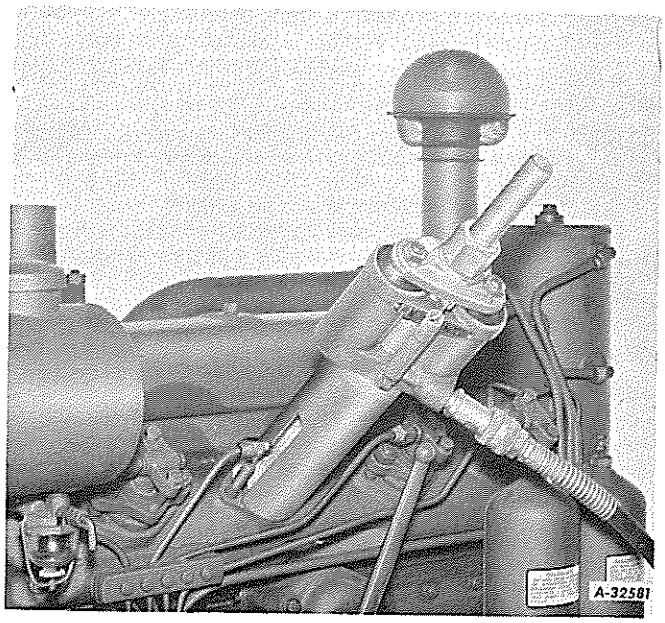
Check Opening Pressure by Using Nozzle Tester.
(Use Portable Nozzle Tester, Bacharach Tester No. 65 - 905 D or Kiene KTP-50)

STEP 20

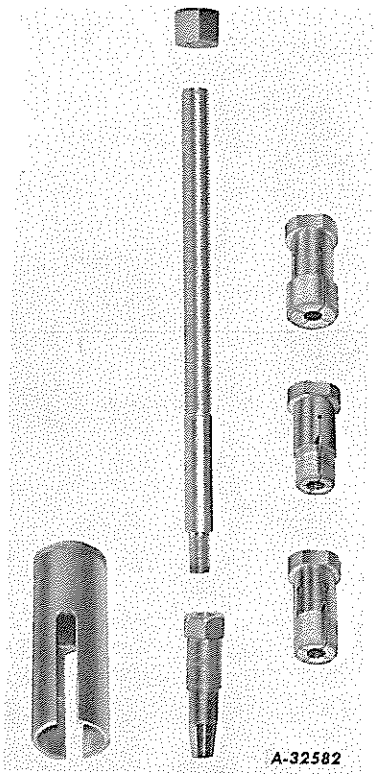
Remove the pre-combustion chambers and check for pitted or burned surfaces.



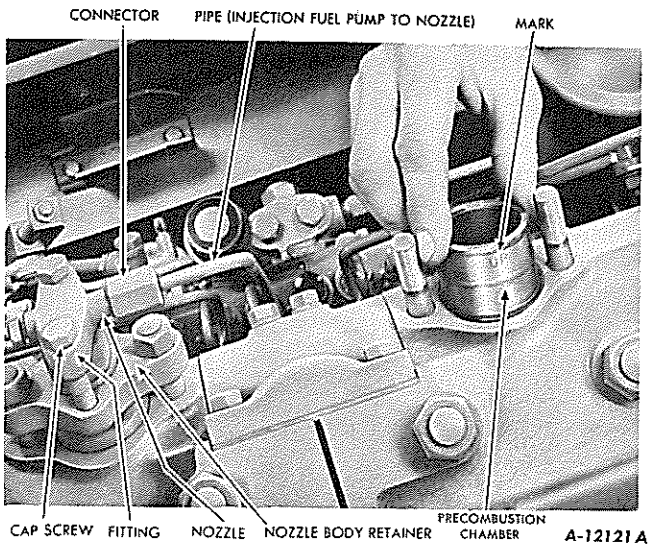
Removing Pre-combustion Chambers Manually. (Use Pre-Cup Puller 1 020 310 R91.)



Removing Pre-Combustion Chambers Hydraulically. (Use Pre-Cup Puller 1 020 310 R91 with Hydraulic Unit.)



Pre-Cup Puller 1 020 310 R91



Check Pre-Combustion Chambers for Pitted or Burned Surfaces. Replace, if Necessary, and Install with New Gaskets.

PRINTED IN UNITED STATES OF AMERICA

STEP 20A (817 Series Only)

INJECTOR PLUNGER AND VALVE ADJUSTMENTS

Whenever the cylinder heads or injectors have been removed and replaced or the cylinder head retorqued, it will be necessary to adjust the injector plungers before starting the engine. The injector plunger setting and valve lash setting are made at the same time for any given cylinder, repeating the procedure for each cylinder in the firing sequence which is 1 - 5 - 3 - 6 - 2 - 4. The injector plunger setting must be made before the valve lash adjustment. The reason for this is that the loading which is applied to the valve lever shaft, when setting the injector plunger, may vary the valve lash adjustment. The procedure for setting the injector plungers and adjusting the valve lash is as follows:

NOTE: As a safety precaution, remove the battery cable from the cranking motor before making any adjustments.

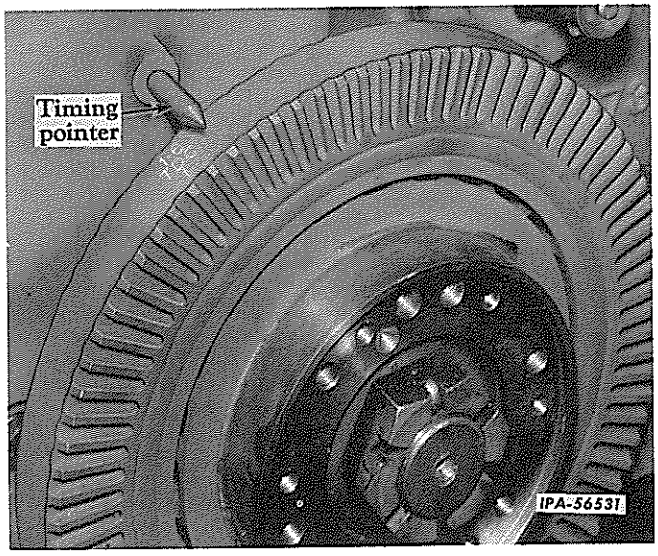
Injector Plunger Setting

1. Crank the engine until the exhaust valves for number six cylinder start to close. The closing of the exhaust valves can be seen plainly by observing the two valves which are furthest to the rear. Continue cranking slowly until the "1 and 6 TDC" mark on the vibration damper is in line with the timing pointer (above right). At this point number one piston is on top-dead-center of the compression stroke.

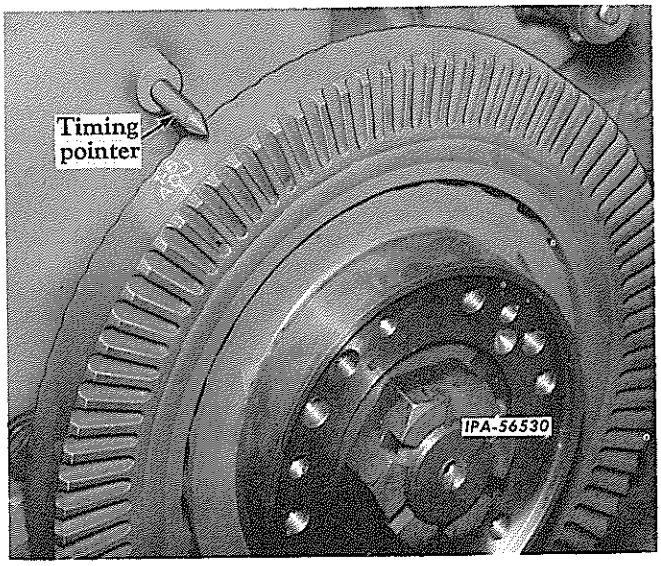
NOTE: Crank the engine using the cranking motor extended shaft. Refer to Section 10, "Cranking Motor," in Service Manual ISS-1041, for detailed instructions.

2. Continue to crank the engine slowly until the "1 and 6 ADJ" mark is in line with the timing pointer (this is 70 degrees after top-dead-center (see next illustration). The engine is now in position to adjust the injector plunger and valves for number one cylinder.

3. Loosen the injector adjusting screw lock nut and check the adjusting screw threads to see that they are clean, well oiled and free-turning.



Showing TDC "1 and 6" Marks on the Vibration Damper.



"1 and 6" Injector Plunger Setting and Valve Lash Timing Mark.

4. Attach a 1/4-inch square adapter to an inch-pound torque wrench. Turn the adjusting screw down slowly and note the torque reading (see next illustration). This is the amount of frictional torque required to turn the adjusting screw.

(Continued on next page.)

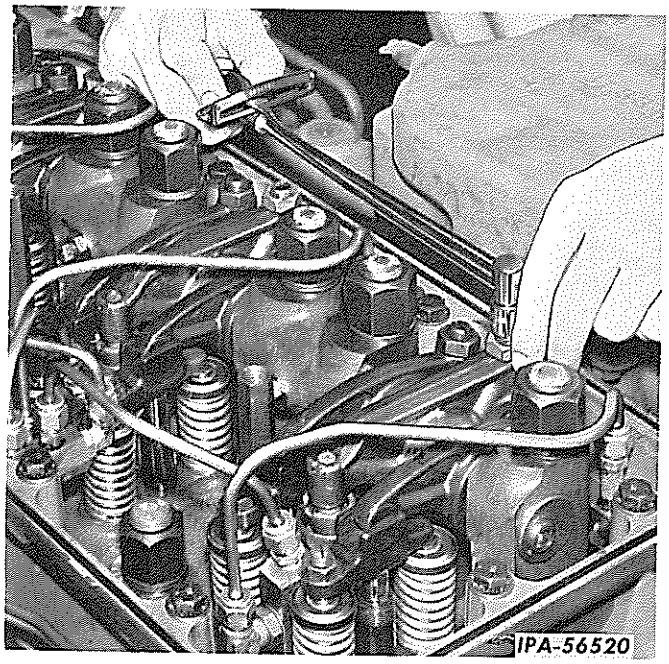
STEP 20A (817 Series Only) – Continued

Injector Plunger Setting - Continued

5. Continue to tighten the adjusting screw until an increase in torque (above the frictional torque reading) is noted. At this point the injector plunger is bottomed in the injector tip. The wrench must be turned very slowly to avoid missing this point.

6. The injector plunger is properly adjusted when a torque of 10 to 12 inch-pounds (engine cold) or 30 to 35 inch-pounds (engine hot) above the adjusting screw thread frictional torque is reached. (Example: Frictional torque 25 inch-pounds plus 10 inch-pounds increase equals 35 inch-pounds cold setting.)

CAUTION: Do not tighten the adjusting screw beyond the specified torque or damage to the injector may result.



Setting Injector Plunger.

Valve Lash Adjustment
(Refer to Next Illustration)

7. With the timing pointer still indexed with the "1 and 6 ADJ" mark on the damper, proceed to adjust the intake and exhaust valves on the number one cylinder.

8. Loosen the intake and exhaust valve adjusting screw lock nuts and bottom of the adjusting screws to force out any excess oil in the push rod sockets, then back them out again.

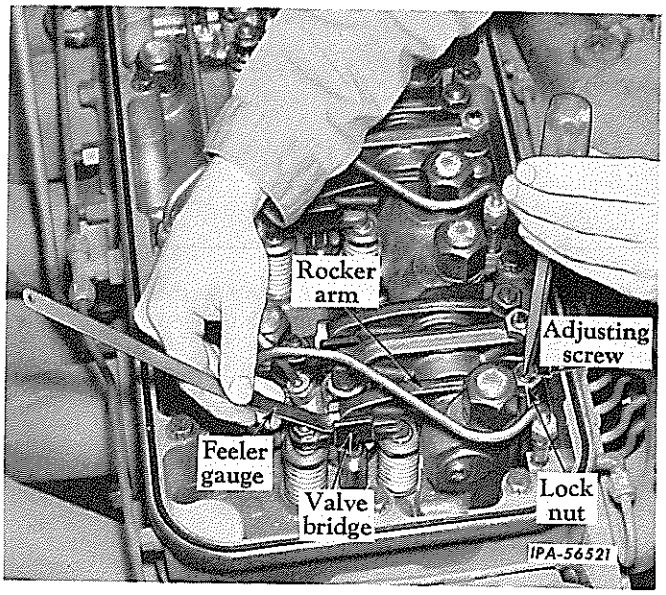
9. Insert a feeler gauge of the specified thickness (refer to "Tune-Up Chart") between the number one intake valve bridge and rocker lever.

10. Turn the adjusting screw down until the rocker lever just touches the feeler gauge. Tighten the lock nut and recheck the clearance.

11. Adjust the clearance on the number one exhaust valve in the same manner.

12. Adjust the rest of the injector plungers and valves in the same manner following the engine firing sequence, which is 1 - 5 - 3 - 6 - 2 - 4. Two complete revolutions of the crankshaft are needed to set all injector plungers and valves.

13. Install the valve covers.

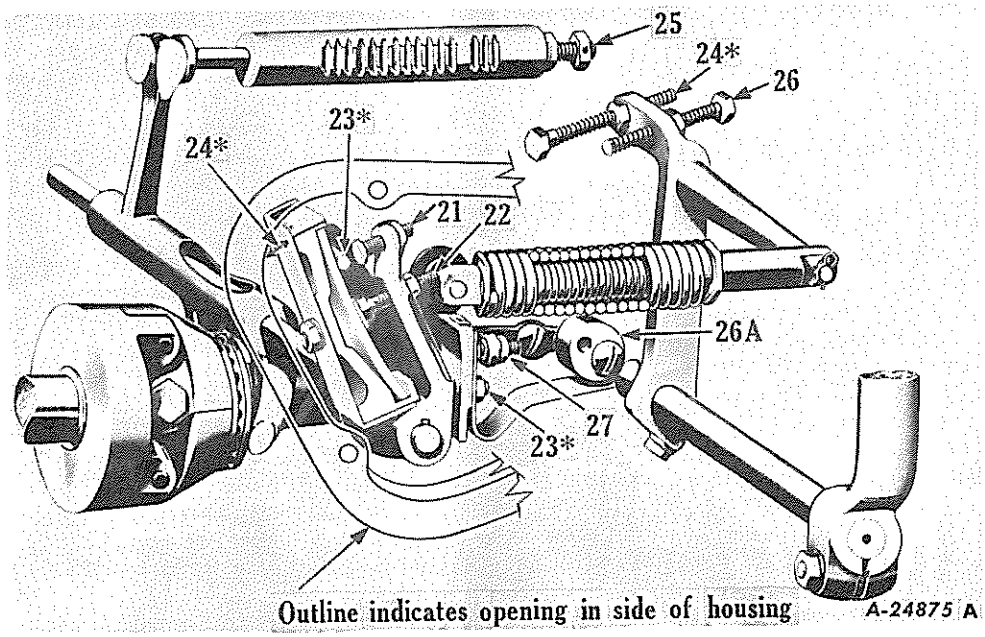


Adjusting Valve Lash.

PRINTED IN UNITED STATES OF AMERICA

IH SINGLE-PLUNGER AND TWIN-PLUNGER PUMPS

POINTS OF ADJUSTMENT AND MEASUREMENT



(Numbers on Illustration Correspond With Step Numbers Below)
*Steps 23 and 24 are Each Illustrated With Two Arrows - One Arrow Shows the Point of Adjustment and the Other Arrow Shows Where to Make the Measurement.

REGULAR TORQUE CONTROL SETTINGS

NOTE: At the factory, injection pumps are accurately set to give the specified horsepower at rated and overload speeds. They are also set to govern satisfactorily between full load rated speed and no load speed.

If the following procedure is observed carefully, a satisfactory field setting can be obtained whenever a pump has been rebuilt and requires resetting. This procedure is to be used only in an emergency when shop facilities and a test stand are not available.

Remove the pump housing oil filler neck, and loosen the lock nut on the rack. The pump housing side cover should be replaced by a cutaway side cover.

STEP 21 - Torque Lever Stop Screw**

Adjust the torque lever stop screw until the face of the screw which contacts the torque lever stop pin is at the proper measurement

** Refer to "Index, Speed Charts," page 32.

(as given in "Speed Charts") from the finished surface of the torque lever; then tighten the lock nut.

This will restrict the movement of the torque lever and have a decided effect on overload fuel delivery as well as the rpm at which the fuel is injected.

STEP 22 - Torque Spring Shoe Screw**

Adjust the torque spring shoe screw until the lower face of the shoe is at the proper measurement (as given in "Speed Charts") from the finished surface beneath the lock nut. This will control the rpm at which the overload fuel is injected.

STEP 23 - Torque Lever Limiting Screw (Overload Gap)**

Adjust the torque lever limiting screw to the proper measurement (as given in "Speed Charts") between the torque lever stop screw and the torque lever stop pin. This adjustment will determine how much overload fuel will be injected at the time of overload.

STEP 24 - Shutoff Stop Screw

Adjust the position of the shutoff stop screw until there is 1/32 to 3/32 inch clearance between the pump housing and the forward end of the torque control assembly. This is to be done with the control lever in full shutoff position. This adjustment will provide clearance throughout the pump linkage and avoid any contact or interference to insure freedon of movement. This is also used to position the plunger (s) for positive shutoff.

STEP 25 - Positive Shutoff

With the engine stopped, disconnect one injection nozzle and connect the fuel pipe to a spare nozzle. Start the engine on gasoline. Adjust the rack adjusting rod nut. Adjust the rack until the injection just starts with the throttle in the off position. Then, adjust the rack by one-quarter turns until the injection just stops. Following this, turn one and one-half full turns in the same direction that stopped injection to insure positive shutoff. NOTE: Do not operate the engine too long on the gasoline cycle. Adjustments must be made within ten minutes or less.

STEP 26 - High Idle Speed

The high idle-speed adjustment controls the rpm at which the engine operates with no load and wide open throttle. Check the high idle speed with a tachometer. If the rpm is incorrect, turn the high idle-speed screw in or out to give the proper rpm.

STEP 26A - Bumper Spring Stop

The bumper spring stop is used to eliminate engine rpm surges. If the engine surges, adjust the stop to give a slight pressure on the bumper spring at high idle speed. It may be necessary to adjust the torque lever pick-up screw (Point 3) again. Recheck the high idle speed and be sure that the engine will shut off on diesel cycle.

STEP 27 - High Idle Gap**

The high idle gap adjustment controls the amount of fuel delivered during normal operation. This gap should be set according to the measurements given in "Speed Charts."

If the engine surges at high idle speed, adjust the bumper spring stop to increase the pressure on the bumper spring.

** Refer to "Speed Charts."

If the engine seems to lack power at rated load speed and overload speeds, the gap between the torque arm and torque arm stop screw should be increased by turning the torque arm stop screw out one-quarter turn. This adjustment can be repeated until the normal engine power has been obtained, but not to the point where the exhaust smoke becomes excessive at rated or overload speeds.

If the engine appears to have excessive power at rated and overload speeds, or if there is excessive exhaust smoke at rated and overload speeds, the gap between the torque arm and torque arm stop screw should be decreased by turning the stop screw in one-quarter turn. Continue turning this screw in (at the same time, checking the power) until correct engine performance has been obtained.

If the engine performance is satisfactory at rated load speed, but the engine lacks power at overload speed and tends to stall easily, the torque lever limiting screw should be turned out one-quarter turn at a time until the power is satisfactory. Do not turn this screw out so far that the exhaust smoke becomes excessive.

If the engine performance is satsifactory except for excessive exhaust smoke at overload speeds, turn the torque lever limiting screw in until the exhaust smoke is normal for overload speed.

If the engine seems to lack the power originally obtained at rated load speed, but is satisfactory at overload speeds, the high speed stop screw can be adjusted to permit the control lever to be pulled back slightly. However, the high idle speed must not exceed the maximum specified in the governor speed change assembly chart.

Two sets of four gauges each are available to facilitate field setting of the high idle gap, and to calibrate the IH Single and Twin Plunger Injection Pumps. (Refer to "Service Tools Manual," ISS-1002, "Fuel System" page 5, Section 4, Illust. 4 and 5.) This shows the range of sizes covered by Part No. 1 020 121 R91. A second set covers the following gap sizes: .060, .070, .080, .110, .115, .120, .140 and .145 (Part No. 1 020 326 R91).

This adjustment can be made without removing the bumper spring, by holding the gauge at an angle between the torque arm stop screw and the torque arm.

The engine is now ready to be checked in actual field operation. The above adjustments can be varied slightly if field performance is not satisfactory.

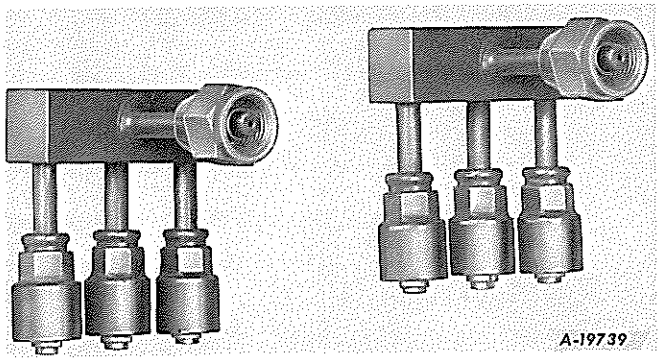
PRINTED IN UNITED STATES OF AMERICA

SOLID TORQUE ARM TORQUE CONTROL SETTINGS

(1) Set the governor spring in the proper torque arm hole (upper hole for higher rpm and lower hole for lower rpm).

(2) Set high speed stop screw for correct high idle. See Speed Chart.

(3) Set torque arm stop screw for correct high idle gap.



Delivery Test Fixture.

EQUALIZE FUEL DELIVERY ON TWIN-PLUNGER PUMPS
(6 Cylinder Engines)

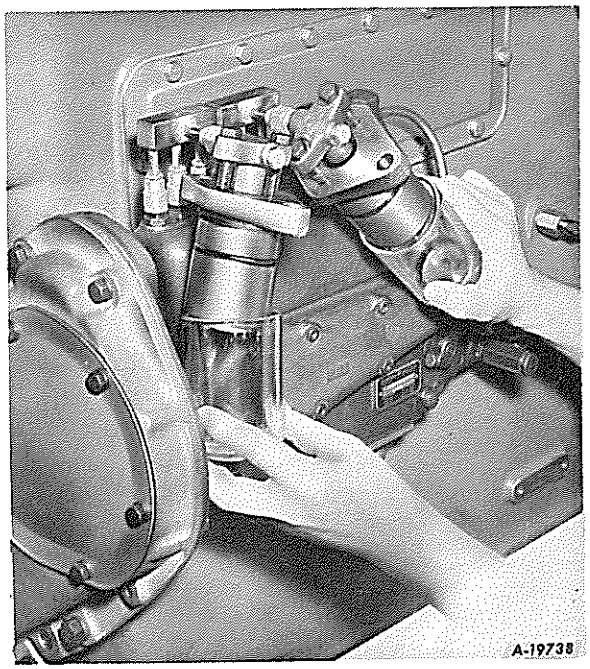
STEP 28

Equalize the fuel delivery of both plungers, as follows:

1. Attach the delivery test fixtures, 1 020 080 R91, to the discharge fittings as shown.

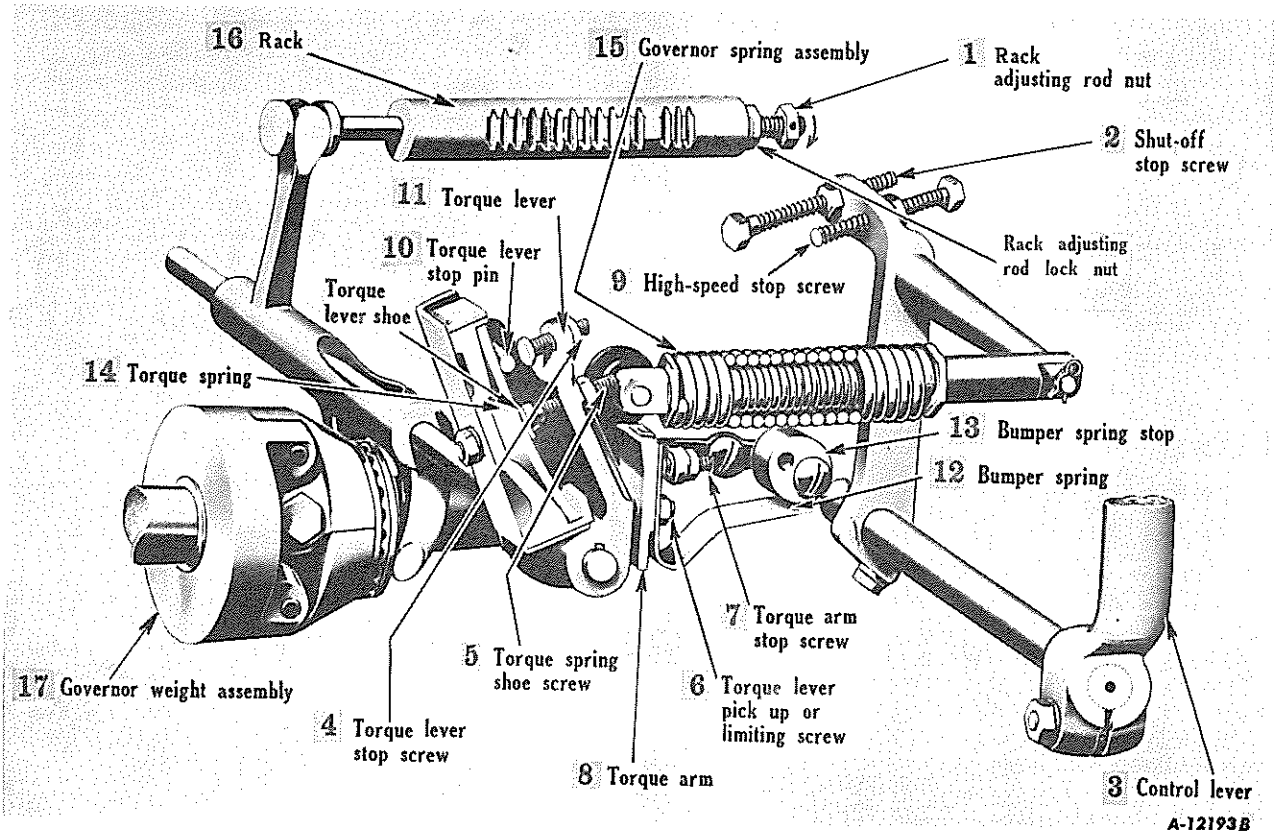
2. Install two spare nozzles on the delivery test fixture. Be sure they are fastened securely. Operate the engine on the gasoline cycle. Open the diesel throttle all the way and collect the fuel from the discharge lines as it leaves the nozzles connected to the fixtures. Collect the fuel in glass containers. Then pour the fuel into calibrated beakers. Collect fuel for one-half minute. Close the diesel throttle and stop the engine; then, measure the fuel delivered by the front and rear plungers.

If the variation is more than four or five cc between the front and the rear plunger, adjust the turnbuckle to balance the delivery of discharge fittings 1, 2 and 3 with delivery from fittings 4, 5 and 6.

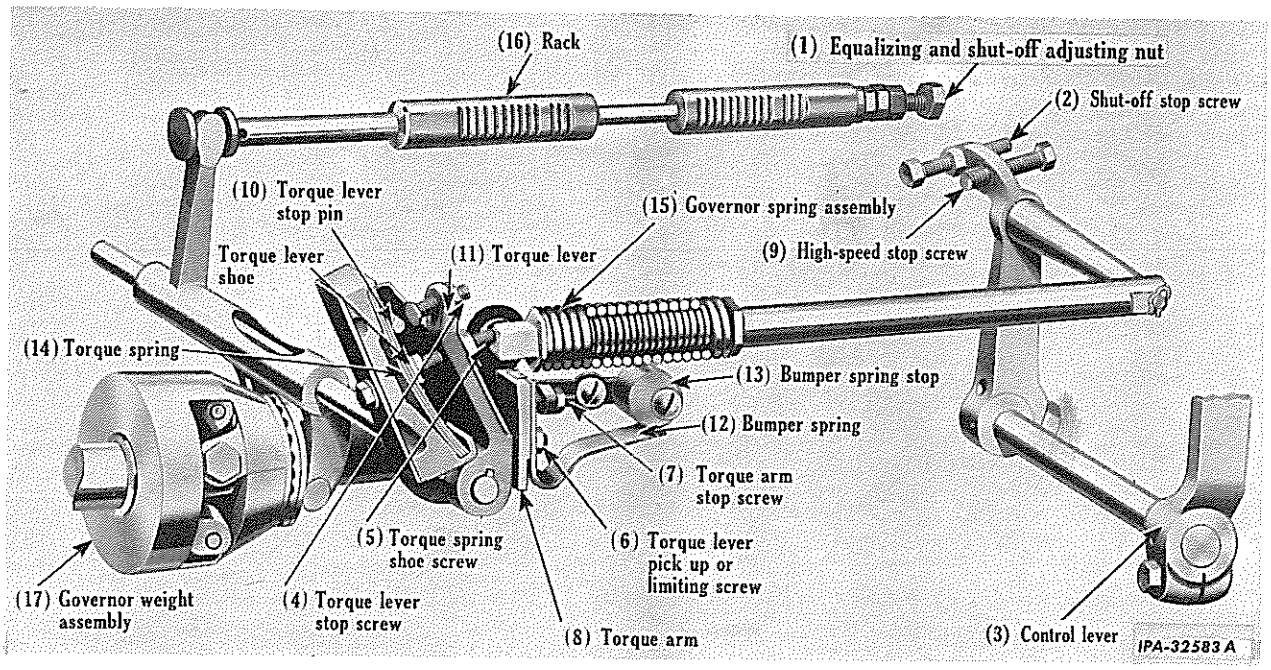


Equalize Fuel Delivery on the Twin-Plunger Pump.

(Continued on page 23)

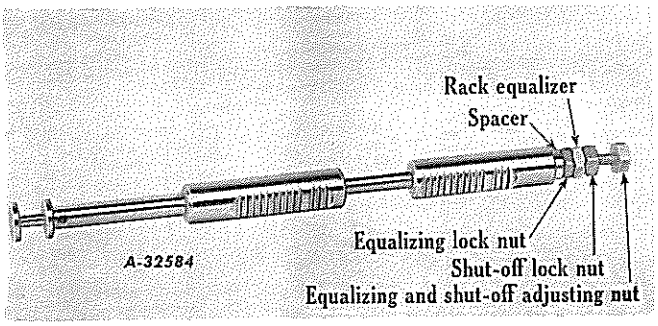


Skeleton View of Governor. (Single-Plunger Pump)



Skeleton View of Governor. (Twin-Plunger Pump)

PRINTED IN UNITED STATES OF AMERICA



For "A" or "B" Series Pumps: Adjust these Points on the Twin-Plunger Rack Assembly.

3. Install a line and nozzle on either the No. 1, 2 or 3 discharge fitting for the front plunger; also, install a line and nozzle on either No. 4, 5 or 6 discharge fitting for the rear plunger.

Adjustment will be made with the engine running on the gasoline cycle.

ADJUSTING THE FRONT PLUNGER:

1. Remove the injection pump oil filler. Through the opening in the pump housing loosen the equalizing and shut-off lock nuts.

2. Turn the equalizing and shut-off adjusting nut clockwise until fuel starts to eject from the front plunger; then, turn this nut counterclockwise until fuel just stops, leaving both lock nuts loose.

ADJUSTING THE REAR PLUNGER:

1. Hold the equalizing and shut-off adjusting nut and turn the rack equalizer (left hand thread) counterclockwise until fuel starts to eject from the rear plunger. Then, turn this nut clockwise until fuel just stops.

(2) At this point, tighten the equalizing lock nut; be careful not to turn the equalizing and shut-off adjusting nut or rack equalizer.

(3) Turn the equalizing and shut-off adjusting nut counterclockwise 1-1/2 turns, then lock the shut-off lock nut. Install the oil filler and gasket.

If the preceding steps are carefully performed, and the equalizing and shut-off adjusting nut and the rack equalizer are not moved from the exact shut-off position, both plungers will be well within the limits outlined below.

Engine Series	* CC Delivery per Test Fixture for 1 Minute	CC Variation Allowed per Test Fixture
16, 525, 18, 18A	200 - 300	5
24, 1091	301 - 400	7

* Delivery will vary due to different engine speeds on the gasoline cycle.

(Continued on next page.)

When performing the tests outlined below, it will be necessary to use Kiene or Bacharach test kits. The illustrations in which the tests appear show Kiene test equipment, but the Bacharach equipment is used in a similar manner.

GENERAL INSTRUCTIONS

(1) When performing the following tests, be sure that the engine is rotated in a clockwise direction (as viewed from the radiator end).

(2) The following instructions give the information necessary to perform the tests in succession. Therefore, the instructions must be performed in the order given.

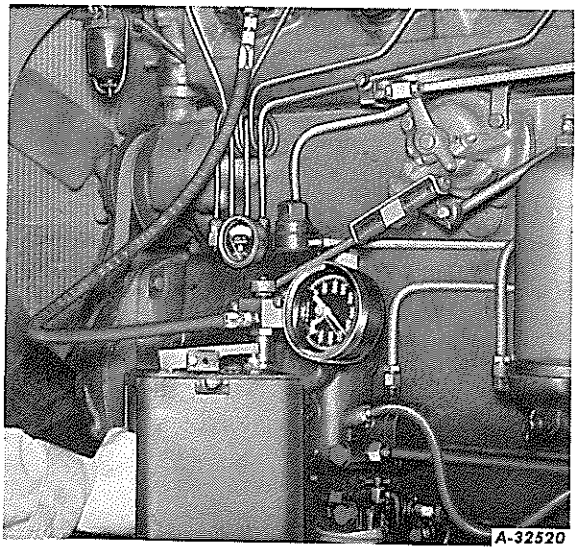
(3) If it is desired to perform only one or several of these tests, the chart following these tests will enable the serviceman to determine quickly what connections to make for the particular test or tests.

(4) If the engine is in operating condition, run the engine until it is thoroughly warmed up before performing these tests.

STEP 29 - Nozzle Leakage and Opening Pressure Test

(1) With the engine stopped, remove the No. 1 nozzle bleeder screw.

(2) Connect the adapter to the bleeder hole.



Perform Nozzle Opening Pressure Test.

(3) Connect the test pump and 1000-pound gauge to the adapter with the flexible line.

(4) Set the adapter to the open position (screw in).

(5) Operate the test pump until the gauge reads 400 pounds. If the pressure drops below 250 pounds in one minute, it indicates nozzle valve or distributor valve leakage. Check the distributor valve for leakage (test chart, pages 29 to 31. If the distributor valve does not leak, it indicates that the nozzle valve is leaking.

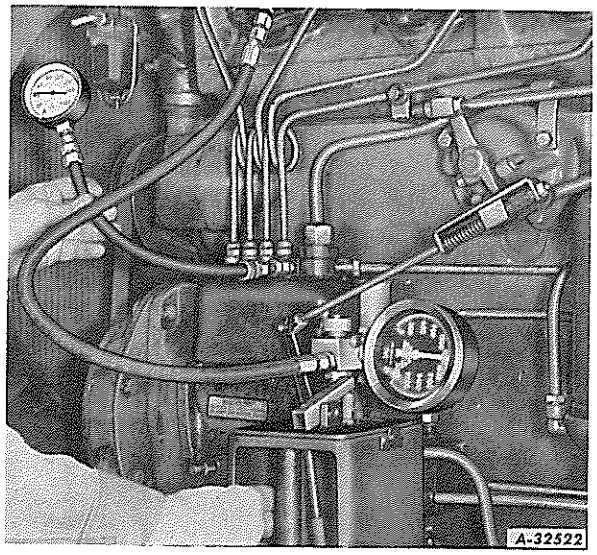
(6) Operate the test pump slowly; the gauge pressure will rise to a point and when the valve opens it will drop. The 1000-pound gauge is equipped with a stop hand which shows the highest pressure reached. This is the nozzle opening pressure and should be recorded. This opening pressure should be between 690 and 740 pounds, with a variation of not over 20 pounds.

STEP 30 - Comparative and Primary Pump Pressure

(1) Replace the 1000-pound gauge with the 3000-pound gauge.

(2) Install the 160-pound gauge on the plunger unit in place of the regular fuel pressure gauge.

(3) Set the adapter to the check valve position (screw up).



Perform Comparative and Primary Pump Pressure Test.

ISS-1012-Y. 3-61.

PRINTED IN UNITED STATES OF AMERICA

(4) With the engine running at high speed, record the pressure reading on the test pump gauge.

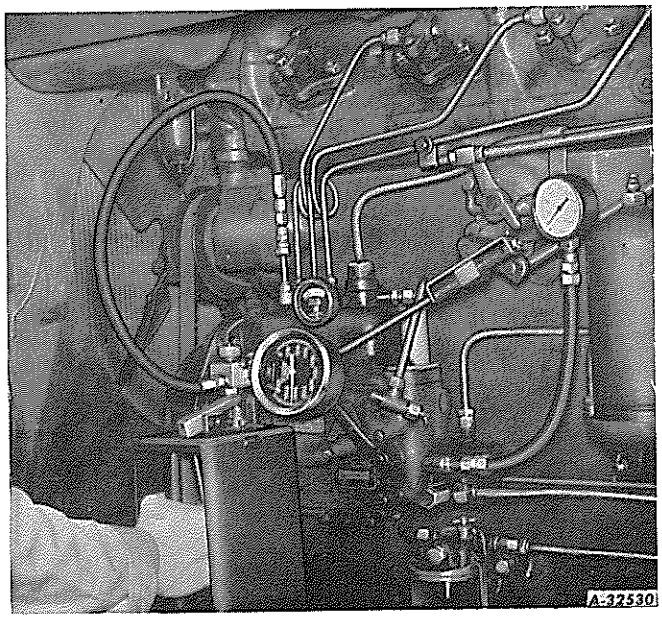
(5) Note the primary pump pressure on the 160 pound gauge on the injection pump.

(6) Repeat the above tests on all cylinders.

STEP 31 - Check and Reverse Check Valve Leakage Test

NOTE: Steps 31 and 32 do not apply to and cannot be made on the 817 series pumps, due to the elimination of the reverse check valve.

(1) Remove the No. 1 high pressure line from the injection pump, and connect the test pump to the No. 1 discharge fitting on the pump with the flexible hose.



Perform Check and Reverse Check Valve Leakage Test.

(2) Set the control lever in the shut-off position.

(3) Make sure that the distributor valve is open. If the maximum pressure that can be obtained is 500 pounds, the valve is open. If 1000 pounds pressure can be reached, the valve is closed. If the valve is closed, maintain the 1000 pound pressure, while slowly rotating the engine until the pressure drops. The valve is now open.

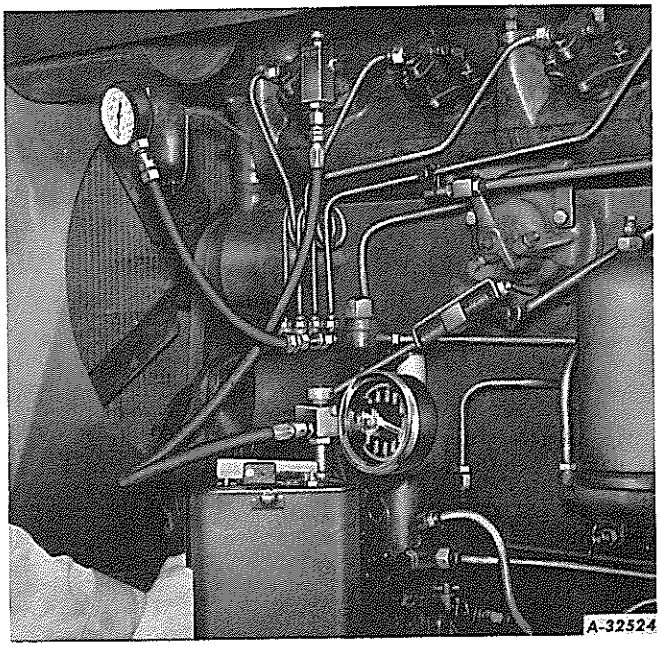
(4) Operate the test pump until the gauge reads 400 pounds.

(5) This pressure must not drop below 250 pounds in one minute.

STEP 32 - Reverse Check Valve Opening Pressure Test

Operate the test pump slowly. The maximum pressure that can be obtained on the gauge is the opening pressure. This pressure should be between 450 and 600 pounds. On twin-plunger pumps, the two valves should not vary over 50 pounds for excellent operation.

NOTE: The two preceding tests must be performed on both plunger units.



Perform Reverse Check Valve Opening Pressure Test.

STEP 33 - Fuel Return Check Valve Opening Pressure Test

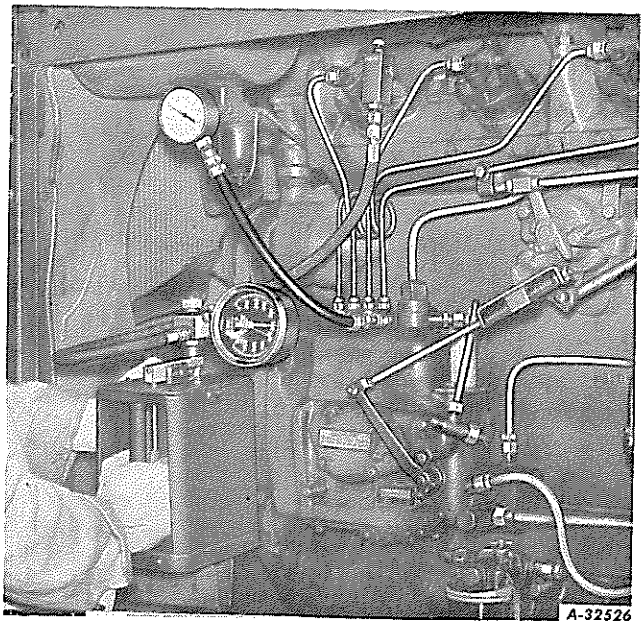
(1) Remove the fuel line leading from the final filter to the plunger unit.

(2) Install the drip pipe in the plunger unit opening. Close the valve on the end of the drip pipe.

(3) Put the speed control lever in the shut-off position.

(4) Operate the test pump. The opening pressure of the valve is indicated on the 160 pound gauge on the plunger unit. This pressure should be 75 to 90 pounds.

Continued on next page.



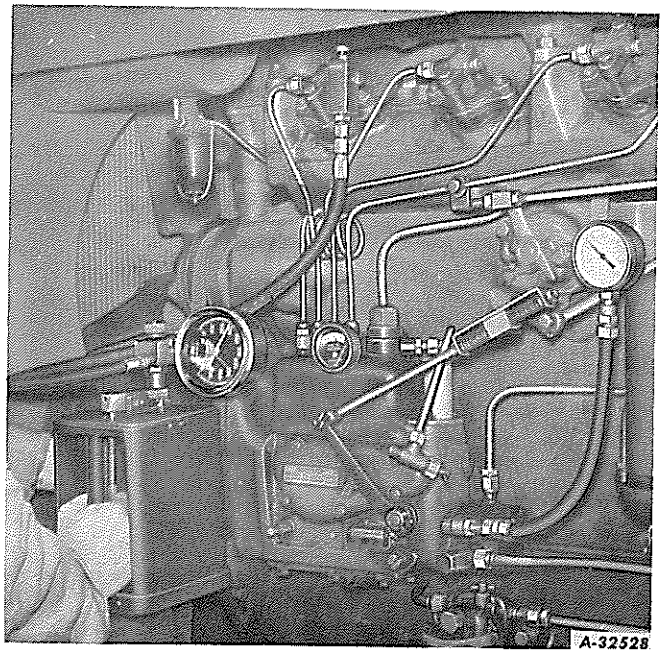
Perform Fuel Return Check Valve Opening Pressure Test.

STEP 34 - Scavenging System Leakage Test "A" Pump Only

(1) Install the regular fuel pressure gauge back on the injection pump instead of the 160 pound gauge.

(2) Remove the fuel line leading from the scavenging pump to the fuel tank. On pumps equipped with a scavenging check valve, remove the valve and spring.

(3) Install the 160 pound gauge in the scavenging pump outlet fitting.



Perform Scavenging System Leakage Test.

(4) Operate the test pump until 20 pounds pressure is reached on the 160 pound gauge.

If the pressure drops below 5 pounds in 30 seconds, there is leakage of the scavenging valve, bearing cage gasket, primary pump packing, or past the primary pump housing bushing.

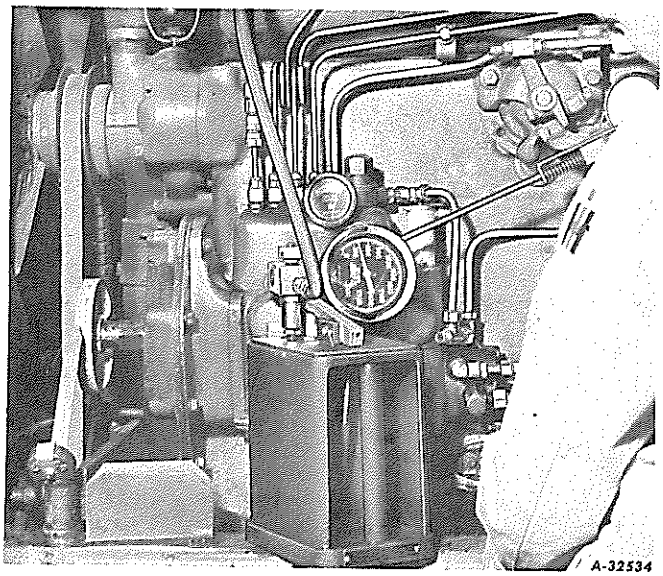
STEP 35 - Distributor Valve and Stem Leakage Test

(1) Install the 3000-pound gauge on the test pump.

(2) Make sure the distributor valve is closed, by turning the crankshaft 180°.

(3) Operate the test pump until the test pump gauge reading is 1500 pounds. If the pressure drops below 1100 pounds in one minute, there is leakage of the distributor valve or stem.

(4) Repeat this test on all distributor valves.



Perform Distributor Valve Leakage Test and Check Distributor Valve Opening Point.

STEP 36 - Test for Plunger Leakage and Degrees of Pump Rotation Between Distributor Valve Opening, Plunger Port Closing, Plunger Port Opening and Distributor Valve Closing

(1) Connect the test pump to the No. 1 discharge fitting on the injection pump.

(2) Install the degree wheel and pointer.

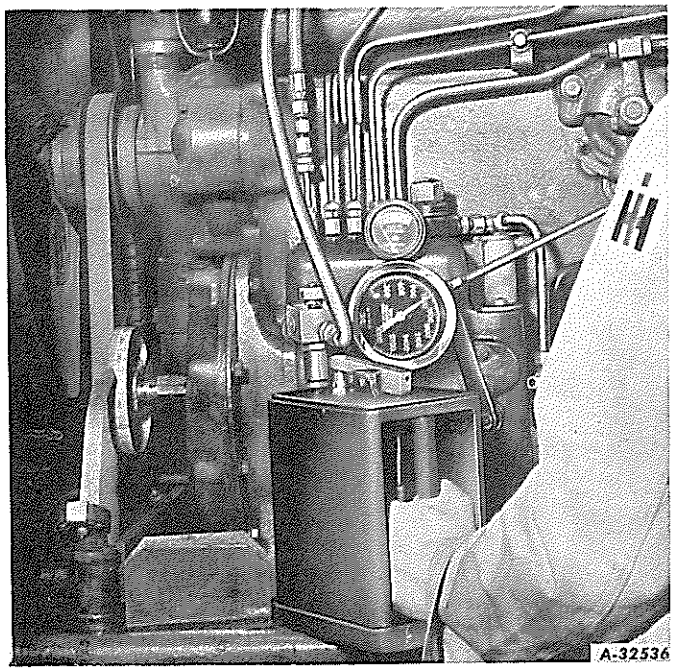
(3) Make sure that the distributor valve is closed by turning the crankshaft 180°.

(4) Put the speed control lever in full-load position.

PRINTED IN UNITED STATES OF AMERICA

(5) Operate the test pump until the gauge reads 2500 pounds. Slowly turn the engine until the pressure drops off sharply. Note the degree mark where the pressure drops off sharply. This is the distributor valve opening point (see illustration in Step 35).

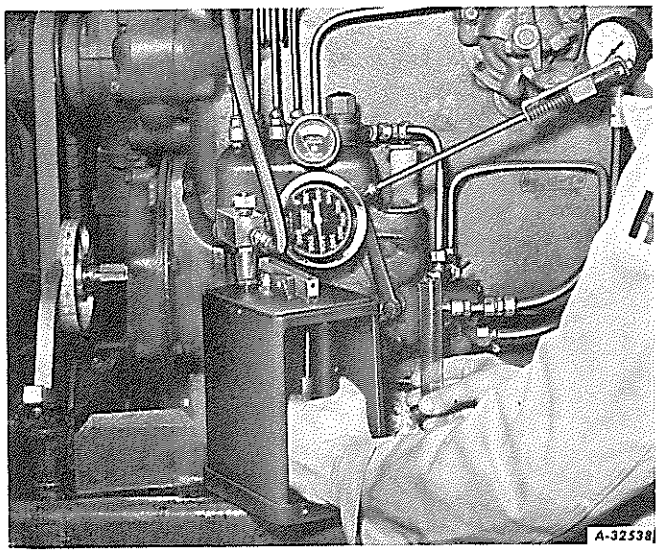
(6) Continue to operate the test pump, and turn the engine slowly until the gauge pressure rises sharply. This is the plunger port closing point. Note the degree reading.



Check Plunger Port Closing Point.

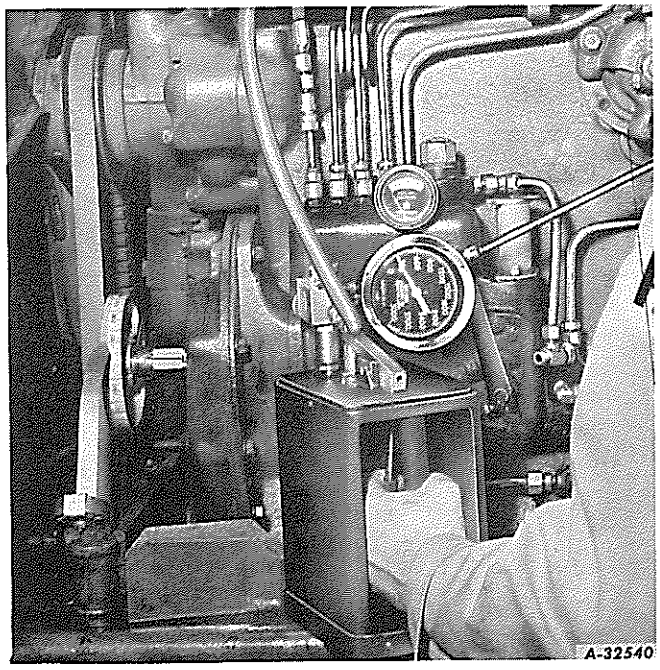
(7) Turn the injection pump about 3° past the port closing point. Open the valve at the end of the drip pipe. Be sure that the drip pipe is in a position so that the fuel will flow downward from the plunger unit opening. Place a container under the end of the pipe.

(8) Operate the test pump until 2500 pounds pressure is obtained. Maintain this pressure for one minute. If the plunger leakage is more than 15 cc per minute, the plunger should be replaced.



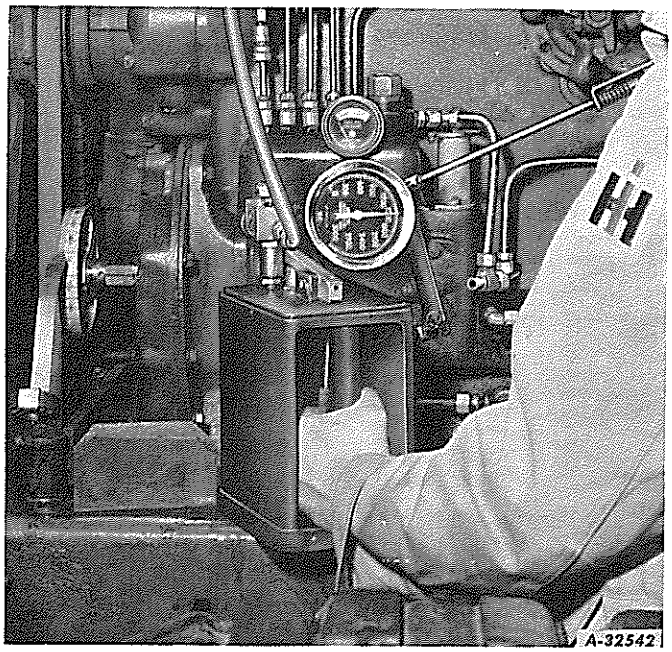
Perform Plunger Leakage Test.

(9) Maintain 2500 pounds pressure, and turn the engine until the pressure drops off sharply. This is the plunger port opening point. Note the degree reading.



Check Plunger Port Opening Point.

(10) Slowly turn the engine, and operate the test pump. The gauge pressure will rise after the injection pump is rotated about 10° past the port opening point. This is the distributor valve closing point. Note the degree reading.



Check Distributor Valve Closing Point.

(11) On twin-plunger pumps, be sure to check both plungers and all distributor valves.

(12) Check the eight standard adjustments on the governor setting, and check the injection pump timing.

CAUTION: Great care must be taken to use clean oil and equipment while making these tests. Dirt pumped into the injection pump from either end will render the various valves unserviceable until cleaned.

For good twin-plunger performance, both reverse check valves should break within 50 pounds pressure of each other. This will assure equal plunger loading and equal fuel line pressure after injection. Plunger port closing between the No. 1 plunger and the No. 2 plunger should be 60°, and port covering at any point of the throttle setting should be the same number of degrees of pump camshaft turning for both plungers. If the degrees are not the same, adjust the rack.

STEP 37 - Primary Pump Leakage Test

A pressure test pump (Kiene or equivalent) is used for this test.

NOTE: It is assumed that the condition of the pressure test pump being used is satisfactory for conducting a "pressure-drop" test.

1. Clean the injection pump and fuel lines with diesel fuel to remove as much dirt accumulation as possible. Avoid the possibility of dirt getting into the lines or fittings when disconnecting them.

2. Remove the inlet and outlet lines from the primary pump. Cap or tape the lines.

3. Install a plug in the outlet of the primary pump. (Dual gear primary pumps have two outlets.)

4. Connect the pressure test pump to the inlet fitting on the primary pump.

5. Raise the pressure slowly, not to exceed 10 psi, and watch the pressure gauge. A falling-off in pressure will indicate internal leakage: No drop in pressure; no internal leakage.

6. If the results of the test indicate a leak in the primary pump, the injection pump must be removed from the engine and to a pump room for further tests and repair.

When this is necessary, be sure all lines and fittings are capped or taped.

PRINTED IN UNITED STATES OF AMERICA

TEST CHART

The following chart gives the information necessary to perform each test individually.

Adjoining each test is a test code composed of letters. Each letter designates a connection to be made before performing the test. The list below gives the test code numbers and the connections which they designate.

1. Remove No. 1 bleeder screw and connect the nozzle adapter to the bleeder hole. Connect the test pump to the adapter.

2. Use a 1000-pound gauge on the test pump.

3. Use a 3000-pound gauge on the test pump.

4. Place the control lever in shut-off position.

5. Place the control lever in full-load position.

6. Remove the injection pump fuel indicator gauge and substitute with a 160-pound gauge.

7. Remove the fuel line leading from the final fuel filter to the plunger unit. Install a drip pipe in the plunger unit opening.

8. On the "A" pumps, remove the fuel line leading from the scavenging pump to the fuel tank. Install a 160-pound gauge in the scavenging pump outlet fitting.

9. Remove No. 1 outlet line from the injection pump. Connect the test pump to the injection pump outlet fitting.

TEST	CODE	INSTRUCTIONS	PROBLEMS AND REMEDY
Nozzle leakage and opening pressure test *	1 , 2	1. **Set adapter to open position (screw in).** 2. Operate pump until gauge shows 400 pounds pressure. If pressure drops below 250 pounds in one minute, nozzle valve or distributor valve is leaking. 3. Check distributor valve for leakage. If satisfactory, service nozzle. 4. Operate test pump slowly. Pressure will rise, then drop. Gauge reading before pressure drops is nozzle opening pressure. 5. Repeat on all nozzles.	Service nozzle if valve leaks or opening pressure is not within limits.
Primary pump pressure	6	1. Start engine 2. Primary pump pressure is registered on 160-pound gauge.	Check filters, by-pass valve, and lines for restriction if pressure is low.
Comparative pressure test *	1 , 3	1. **Set adapter to check valve position (screw up).** 2. With engine running at high idle, record test pump gauge pressure. 3. Repeat on all cylinders.	If pressure is high, check for nozzle restriction. If pressure is low, check compression.
Test check and reverse check valves for leakage *	2 , 9	1. Make sure that distributor valve is open. 2. Operate test pump until gauge pressure is 400 pounds. This pressure must not drop below 250 pounds in one minute. If pressure drops below 250 pounds in one minute, reverse check valve is leaking.	If there is leakage, replace check block assembly.

* Except 817 Series Pump.

TEST	CODE	INSTRUCTIONS	PROBLEMS AND REMEDY
Reverse check valve opening pressure *	2 , 9	1. Make sure that distributor valve is open. 2. Operate test pump slowly. Maximum pressure that can be obtained on test pump gauge is reverse check valve opening pressure. This pressure should be between 450 and 600 pounds. On twin-plunger pumps, the two valves should not vary over 50 pounds.	If pressure is not within limits, replace valve spring or add or remove shims under valve stop.
Fuel return check valve opening pressure *	4 , 6 , 7 , 9	1. Make sure that distributor valve is open. 2. Close valve on end of drip pipe. 3. Operate test pump. Opening pressure of fuel return check valve is indicated on 160-pound gauge. This pressure should be 75 to 90 pounds .	If opening pressure is not within limits, replace valve spring or check for dirt on valve seat.
Test fuel return and scavenging unit for leakage ("A" pump only)	4 , 7 , 8 , 9	1. Make sure that distributor valve is open. 2. Close valve on end of drip pipe. 3. Operate test pump until 20 pounds pressure is indicated on 160-pound gauge. If pressure drops below 5 pounds in 30 seconds, there is leakage of scavenging valve, bearing cage gasket, primary pump packing, or past primary pump housing bushing.	If there is leakage, replace the scavenging valve or primary pump or other parts as necessary.
Test for leaking distributor valves and stems	3 , 9	1. Make sure that distributor valve is closed. 2. Operate test pump until gauge reads 1500 pounds. If pressure drops below 1100 pounds in one minute, there is leakage of the distributor valve. 3. Repeat on all valves.	If there is leakage, replace valves and seats or distributor unit.
Test for plunger leakage and degrees of pump rotation between distributor valve opening, plunger port closing, plunger port opening, and distributor valve closing. *	3 , 5 , 7 , 9	1. Install degree wheel and pointer. 2. Make sure that distributor valve is closed. 3. Operate test pump until gauge shows 2500 pounds pressure. Pressure will drop slowly. Slowly turn engine until pressure drops sharply. Note degree mark. This is distributor valve opening point. 4. Continue to operate test pump and turn engine slowly until gauge pressure rises sharply. Note degree reading. This is port closing point.	If leakage of plunger is excessive, replace plunger and barrel or entire plunger unit. If there is less than 3° between any distributor valve opening and plunger port closing point, it indicates a worn cam lobe. Total degrees of port closure for each plunger on twin-plunger pumps should be equal. If they

* Except 817 series pump.

PRINTED IN UNITED STATES OF AMERICA

TEST	CODE	INSTRUCTIONS	PROBLEMS AND REMEDY
		5. Rotate injection pump 3° past port closing point. Open valve on end of drip pipe. Make sure that drip pipe is in position so that fuel will flow downward from plunger unit opening. Place container under drip pipe valve. 6. Operate test pump until 2500 pounds gauge pressure is obtained. Maintain this pressure for one minute. If leakage is more than 15 cc per minute, leakage is excessive. 7. Maintain 2500 pounds gauge pressure, and turn engine until pressure drops off sharply. Note degree reading. This is plunger port opening point. 8. Operate test pump, and slowly turn engine. Gauge pressure will rise after the pump is rotated about 10° past port opening point. Note degree reading. This is distributor valve closing point. 9. On twin-plunger pumps, check both plunger units and all distributor valves.	vary, it indicates that plungers are not synchronized. If degrees between distributor valve opening and plunger port closing for any bank is different from the other bank, it indicates a worn eccentric.

Torque control adjustments for standard application pumps and pumps used on manufacturer customers' units must be performed in a definite sequence as indicated by the numbers 1, 2, 3 and 7 at the top of the torque control adjustment columns on the following charts. Do not adjust point 7 until points 4, 5, and 6 have been adjusted. For detailed instructions on making all torque control adjustments, refer to steps 21 through 27.

PRIOR TO "A" PUMPS - IH Single and Twin Plunger

GOVERNOR SPEED CHANGE CHART - STANDARD APPLICATIONS

Model	Pump Part No.	Normal Governed Engine Speed at Test Load and Wide Open Gov.	Governed High Idle Speed	Regulation Percent	Governor Spring Assembly	Outer Spring	
						Outside Diam.	No. of Coils
TD-6, WD-6, MD, MDV	65 306 D1	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ± 1
ID-6	65 306 D2	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ± 1
IUD-6	65 306 D3	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ± 1
UD-6	65 306 D4	1500 ± 10	1665 ± 30	11	253 258 R91	.750	17 ± 1
TD-9	65 309 D1	1400 ± 10	1555 ± 30	11	70 264 D	.750	15-1/2 ± 1
WD-9, IUD-9	65 309 D2	1500 ± 10	1665 ± 30	11	254 839 R91	.770	15-1/2 ± 1
ID-9	65 309 D3	1500 ± 10	1665 ± 30	11	254 839 R91	.770	15-1/2 ± 1
UD-9	65 309 D4	1500 ± 10	1665 ± 30	11	254 839 R91	.770	15-1/2 ± 1
WDR-9	65 309 D5	1500 ± 10	1665 ± 30	11	254 839 R91	.770	15-1/2 ± 1
TD-14	65 314 D1	1350 ± 10	1500 ± 30	11	67 389 D	.750	20 ± 1
UD-14	65 314 D6	1350 ± 10	1500 ± 30	11	67 389 D	.750	20 ± 1
TD-14A	65 314 D101	1400 ± 10	1555 ± 30	11	257 134 R91	.750	18-1/2 ± 1
UD-14A	65 314 D102	1400 ± 10	1555 ± 30	11	67 389 D	.750	20 ± 1
TD-14	65 314 D103	1400 ± 10	1555 ± 30	11	257 134 R91	.750	18-1/2 ± 1
UD-16	253 602 R91	1800 ± 10	2000 ± 35	11	257 122 R91	.750	18-1/2 ± 1
TD-18A	253 701 R91	1350 ± 10	1500 ± 30	11	257 135 R91	.718	20 ± 1
UD-18A	253 702 R91	1600 ± 10	1775 ± 30	11	257 064 R91	.741	24 ± 1
TD-18	253 703 R91	1300 ± 10	1445 ± 30	11	257 135 R91	.718	20 ± 1
TD-24	253 801 R91	1300 ± 10	1445 ± 30	11	256 652 R91	.718	22 ± 1
TD-24, UD-24	253 802 R91	1375 ± 10	1525 ± 30	11	256 786 R91	.7305	27 ± 1

PRINTED IN UNITED STATES OF AMERICA

PRIOR TO "A" PUMPS - IH Single and Twin Plunger

FUEL DELIVERY AND TORQUE ARM ADJUSTMENT CHART - STANDARD APPLICATIONS

For Testing on IH Test Stand with IH Injection Nozzles Set at 700 P.S.I. Opening Pressure

The deliveries listed below were obtained by using nozzles 52 613 D, furnished with the test stand. It is essential that 52 613 D, DA, DB or DC shall be used with the test stand.

Fuel oil with a viscosity of 33 to 35 Saybolt Universal seconds at 100° F. was used for testing IH pumps when these figures were obtained. A fuel of higher viscosity will give more fuel delivery, and a fuel of lower viscosity will give less fuel delivery.

Model	Average Delivery in CC, at 550 r.p.m. for 550 revolutions	Maximum Permissible Variation of Any Nozzle from Average Deliv'y in CC	** Torque Control Adjustment				Torque Springs		
			1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over-load Gap	7 * High Idle Gap	No. Reqd.	Part No.	Thick-ness
TD-6, WD-6, MD, MDV	53	±3	3/8	5/8	1/16	.085	7	260 907 R2	.014
ID-6	53	±3	3/8	5/8	1/16	.085	7	260 907 R2	.014
IUD-6	53	±3	3/8	5/8	1/16	.085	7	260 907 R2	.014
UD-6	53	±3	3/8	5/8	1/16	.085	7	260 907 R2	.014
TD-9	63	±3	7/16	11/16	1/16	.090	7	260 907 R2	.014
WD-9, IUD-9	63	±3	7/16	11/16	1/16	.090	7	260 907 R2	.014
ID-9	63	±3	7/16	11/16	1/16	.090	7	260 907 R2	.014
UD-9	63	±3	7/16	11/16	1/16	.090	7	260 907 R2	.014
WDR-9	63	±3	7/16	11/16	1/16	.090	7	260 907 R2	.014
TD-14	80	±3	3/8	5/8	3/32	.090	10	259 736 R3	.010
UD-14	80	±3	3/8	5/8	3/32	.090	10	259 736 R3	.010
TD-14A	91	±3	3/8	5/8	1/16	.105	10	259 736 R3	.010
UD-14A	91	±3	3/8	5/8	1/16	.100	10	259 736 R3	.010
TD-14	90	±3	3/8	5/8	1/16	.105	10	259 736 R3	.010
UD-16	73	±3	3/8	11/16	1/8	.075	7	260 907 R2	.014
TD-18A	94	±4	7/16	5/8	1/16	.115	3	259 736 R3	.010
							2	259 737 R3	.020
UD-18A	94	±4	7/16	5/8	1/16	.115	3	259 736 R3	.010
							2	259 737 R3	.020
TD-18	92	±4	7/16	5/8	1/16	.115	3	259 736 R3	.010
							2	259 737 R3	.020
TD-24	116***	±5	3/8	5/8	1/16	.125	3	259 736 R3	.010
							2	259 737 R3	.020
TD-24, UD-24	116***	±5	3/8	5/8	1/16	.125	3	259 736 R3	.010
							2	259 737 R3	.020

*Indicates the gap between the torque arm and the torque arm stop screw at governed high idle speed. This measurement must be taken with the bumper spring removed unless the high idle gap tool 1 020 121 R91 or 1 020 326 R91 is used.

**These dimensions should also be used when following the procedure for setting IH single plunger pumps on Bosch test stands.

***On some test benches already equipped with 100 CC beakers, it will be necessary to run the test bench at 550 r.p.m. for 1/2 minute, to obtain 1/2 the delivery listed above.

FOR "A" PUMPS - IH Single and Twin Plunger

GOVERNOR SPEED CHANGE CHART - STANDARD APPLICATIONS

Model	Pump Part No.	Normal Governed Engine Speed (RPM) At Test Load and Wide Open Governor	Governed High Idle Speed (RPM)	Regulation Percent	Governor Spring Assembly	Outer Spring	
						Outside Diameter	Number of Coils
TD-6, WD-6, MD, MDV	65 306 DA1 & 65 306 DA101	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ±1
TD-6, WD-6, IUD-6, MD, MDV (increased power)	65 306 DA201	1450 ± 10	1610 ± 30	11	266 073 R91	.770	17-1/2 ±1
ID-6	65 306 DA2 & 65 306 DA102	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ±1
ID-6 (increased power)	65 306 DA202	1450 ± 10	1610 ± 30	11	266 073 R91	.770	17-1/2 ±1
IUD-6	65 306 DA3 & 65 306 DA103	1450 ± 10	1610 ± 30	11	253 258 R91	.750	17 ±1
UD-6	65 306 DA4 & 65 306 DA104	1500 ± 10	1665 ± 30	11	253 258 R91	.750	17 ±1
UD-6A	65 306 DA229	1600 ± 10	1775 ± 30	11	254 839 R91	.770	15-1/2 ±1
Super MD, Super MDV, Super WD-6	265 401 R91	1450 ± 10	1580 ± 30	9	254 839 R91	.770	15-1/2 ±1
UD-264	265 430 R91	1800 ± 10	1960 ± 30	9	265 513 R91	.770	15-1/2 ± 1
TD-9	65 309 DA1 & 65 309 DA101	1400 ± 10	1555 ± 30	11	253 258 R91	.750	17 ±1
TD-9 (increased power)	65 309 DA201	1400 ± 10	1555 ± 30	11	253 258 R91	.750	17 ±1
WD-9, IUD-9	65 309 DA2 & 65 309 DA102	1500 ± 10	1665 ± 30	11	67 383 D	.770	15-1/2 ±1
WD-9 (increased power)	65 309 DA202	1500 ± 10	1665 ± 30	11	70 264 D	.750	17-1/2 ±1
ID-9	65 309 DA3 & 65 309 DA103	1500 ± 10	1665 ± 30	11	67 383 D	.770	17-1/2 ±1
ID-9 (increased power)	65 309 DA203	1500 ± 10	1665 ± 30	11	70 264 D	.750	17-1/2 ±1
UD-9	65 309 DA4 & 65 309 DA104	1500 ± 10	1665 ± 30	11	67 383 D	.770	17-1/2 ±1
UD-9A	65 309 DA204	1600 ± 10	1775 ± 30	11	254 839 R91	.770	15-1/2 ±1
WDR-9	65 309 DA5 & 65 309 DA105	1500 ± 10	1665 ± 30	11	67 383 D	.770	17-1/2 ±1
WDR-9 (increased power)	65 309 DA205	1500 ± 10	1665 ± 30	11	70 264 D	.750	15-1/2 ±1
UD-350	268 315 R91	1800 ± 10	1960 ± 30	9	264 828 R91	.750	17 ±1
TD-14	65 314 DA1	1350 ± 10	1500 ± 30	11	67 389 D	.750	20 ±1
TD-14A	65 314 DA101	1400 ± 10	1555 ± 30	11	67 389 D	.750	20 ±1
UD-14A	65 314 DA102	1400 ± 10	1555 ± 30	11	67 389 D	.750	20 ±1
TD-14 (cut back)	65 314 DA103	1400 ± 10	1555 ± 30	11	253 258 R91	.750	17 ±1
TD-14	65 314 DA106	1400 ± 10	1525 ± 30	9	264 828 R91	.750	17 ±1
UD-14	65 314 DA6	1350 ± 10	1500 ± 30	11	67 389 D	.750	20 ±1
UD-16	253 602 R92	1800 ± 10	2000 ± 35	11	257 720 R91	.750	17-1/2 ±1
UD-525	268 502 R91	1800 ± 10	1960 ± 30	9	268 472 R91	.750	20 ±1
TD-18A	253 701 R92	1350 ± 10	1500 ± 30	11	257 063 R91	.7305	25 ±1
UD-18A	253 702 R92	1600 ± 10	1775 ± 30	11	257 064 R91	.741	24 ±1
TD-18	253 703 R92	1300 ± 10	1445 ± 30	11	256 786 R91	.7305	27 ±1
TD-24, UD-1091	253 814 R91	1400 ± 10	1525 ± 30	9	267 228 R92	.7305	18-1/4 ±1

PRINTED IN UNITED STATES OF AMERICA

FOR "A" PUMPS - IH Single and Twin Plunger

FUEL DELIVERY AND TORQUE ARM ADJUSTMENT CHART - STANDARD APPLICATIONS

For Testing on IH Test Stand with IH Injection Nozzles Set at 700 P.S.I. Opening Pressure

The deliveries listed below were obtained by using nozzles 52 613 D, furnished with the test stand. It is essential that 52 613 D, DA, DB or DC shall be used with the test stand.

Fuel oil with a viscosity of 33 to 35 Saybolt Universal seconds at 100°F. was used for testing when these figures were obtained. A fuel of higher viscosity will give more fuel delivery, and a fuel of lower viscosity will give less fuel delivery.

Model	Average Delivery in CC, at 550 rpm. for 550 revolutions	Maximum Permissible Variation of Any Nozzle from Average Delivery, in CC	** Torque Control Adjustment				Torque Springs		
			1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Overload Gap	7 * High Idle Gap	Number Reqd.	Part No.	Thickness
TD-6, WD-6, MD, MDV	53	±3	3/8	37/64 ± 1/32	3/64 ± 1/32	.090 ± .005	7	260 907 R2	.014
TD-6, WD-6, IUD-6, MD, MDV (increased power).	61	±3	7/16	39/64 ± 1/32	5/64 ± 1/32	.115 ± .005	8	260 907 R2	.014
ID-6,	53	±3	3/8	37/64 ± 1/32	3/64 ± 1/32	.090 ± .005	7	260 907 R2	.014
ID-6 (incr. power)	61	±3	7/16	39/64 ± 1/32	5/64 ± 1/32	.115 ± .005	8	260 907 R2	.014
IUD-6	53	±3	3/8	37/64 ± 1/32	3/64 ± 1/64	.090 ± .005	7	260 907 R2	.014
UD-6	53	±3	3/8	37/64 ± 1/32	3/64 ± 1/32	.090 ± .005	7	260 907 R2	.014
UD-6A	62	±3	7/16	41/64 ± 1/32	1/64 ± 1/32	.110 ± .005	8	260 907 R2	.014
Super MD, Super MDV, Super WD-6	69	±3	7/16	5/8 ± 1/32	1/32 ± 1/64	.060± .005	8	260 907 R2	.014
UD-264	69	±3	7/16	37/64 ± 1/32	1/16 ± 1/64	.070± .005	8	260 907 R2	.014
TD-9,	63	±3	7/16	5/8 ± 1/32	1/64 ± 1/64	.085 ± .005	7	260 907 R2	.014
TD-9 (incr. power).	65	±3	7/16	41/64 ± 1/32	1/64 ± 1/64	.075 ± .005	7	260 907 R2	.014
WD-9, IUD-9	63	±3	7/16	5/8 ± 1/32	1/64 ± 1/64	.085 ± .005	7	260 907 R2	.014
WD-9 (incr. power).	65	±3	7/16	41/64 ± 1/32	5/64 ± 1/64	.075 ± .005	7	260 907 R2	.014
ID-9	63	±3	7/16	5/8 ± 1/32	1/64 ± 1/64	.085 ± .005	7	260 907 R2	.014
ID-9 (incr. power) .	65	±3	7/16	41/64 ± 1/32	5/64 ± 1/64	.075 ± .005	7	260 907 R2	.014
UD-9	63	±3	7/16	5/8 ± 1/32	1/64 ± 1/64	.085 ± .005	7	260 907 R2	.014
UD-9A	70	±3	7/16	41/64 ± 1/32	1/16 ± 1/64	.095 ± .005	7	260 907 R2	.014
WDR-9	63	±3	7/16	5/8 ± 1/32	1/64 ± 1/64	.085 ± .005	7	260 907 R2	.014
WDR-9 (incr. power)	65	±3	7/16	41/64 ± 1/32	5/64 ± 1/64	.075 ± .005	7	260 907 R2	.014
UD-350 (pump 268 315 R91)			7/16	39/64 ± 1/32	1/64 ± 1/64	.095 ± .005	7	260 907 R2	.014
TD-14	80	±3	3/8	5/8 ± 1/64	1/16	.095	10	259 736 R3	.010
TD-14A	91	±3	3/8	5/8 ± 1/64	3/64 ± 1/32	.105 ± .005	10	259 736 R3	.010
UD-14A	91	±3	3/8	5/8 ± 1/64	3/64 ± 1/32	.105 ± .005	10	259 736 R3	.010
TD-14 (cut back)	90	±3	3/8	5/8 ± 1/64	1/16 ± 1/32	.095 ± .005	10	259 736 R3	.010
TD-14A	91	±3	3/8	39/64 ± 1/32	3/64 ± 1/32	.105 ± .005	10	259 736 R3	.010
UD-14	80	±3	3/8	5/8 ± 1/64	1/16	.095	10	259 736 R3	.010
UD-16	73	±3	3/8	19/32 ± 1/32	1/16 ± 1/64	.070 ± .010	7	260 907 R2	.014
UD-525	77	±3	7/16	5/8 ± 1/32	1/16 ± 1/64	.110 ± .005	7	260 907 R2	.014
TD-18A	94	±4	7/16	39/64 ± 1/32	5/64 ± 1/64	.105 ± .010	3 2	259 736 R3 259 737 R3	.010 .020
UD-18A	94	±4	7/16	39/64 ± 1/32	1/16 ± 1/64	.105 ± .010	3 2	259 736 R3 259 737 R3	.010 .020
TD-18	92	±4	7/16	41/64 ± 1/32	1/16 ± 1/64	.105 ± .010	3 2	259 736 R3 259 737 R3	.010 .020
TD-24, UD-1091	128***	±5	7/16	5/8 ± 1/32	3/64 ± 1/64	.140 ± .005	3 2	259 736 R3 259 737 R3	.010 .020

*Indicates the gap between the torque arm and the torque arm stop screw at governed high idle speed. On old type bumper springs, this measurement must be taken with bumper spring removed unless high idle gap tool 1 020 121 R91 is used.

**These dimensions should also be used in the procedure for setting IH single-plunger pumps on Bosch test stands.

***On some test benches already equipped with 100 CC beakers, it will be necessary to run the test bench at 550 r. p. m. for 1/2 minute, to obtain 1/2 the delivery listed above.

FOR "B" PUMPS - IH Single and Twin Plunger

GOVERNOR SPEED CHANGE CHART - STANDARD APPLICATIONS

Model	Pump part no.	Normal governed engine speed (rpm) at test load and wide open governor	Governed high idle speed (rpm)	Regulation percent	Governor spring assembly	Outer Spring	
						Outside diameter	Number of coils
TD-6	270 353 R91	1450 ± 10	1610 ± 30	11	266 073 R91	.770	17-1/2 ± 1
TD-6 (61)	270 021 R91	1550 ± 10	1690 ± 30	9	265 513 R91	.770	15-1/2 ± 1
Super MD, MDV, WD-6, FAR 400D, DHC, INT-400D	270 000 R91	1450 ± 10	1580 ± 30	9	267 711 R91 266 073 R91	.750 .770	16 ± 1 17-1/2 ± 1
D-281-FAR-450D-DHC, INT-450D	270 024 R91	1450 ± 10	1580 ± 30	9	267 711 R91	.750	16 ± 1
UD-264	270 013 R91	1800 ± 10	1960 ± 30	9	274 495 R91 276 468 R91	.750 .770	17 ± 1 17-1/2 ± 1
UD-281-4	270 028 R91	1800 ± 10	1960 ± 30	9	274 462 R91	.750	15 ± 1
TD-9	270 372 R91	1400 ± 10	1555 ± 30	11	253 258 R91	.750	17 ± 1
TD-9 (91)	270 074 R91	1550 ± 10	1690 ± 30	9	265 509 R91	.750	15 ± 1
WD-9, ID-9, WDR-9	270 373 R91	1500 ± 10	1665 ± 30	11	70 264 D	.750	17-1/2 ± 1
UD-9A	270 374 R91	1600 ± 10	1775 ± 30	11	254 839 R91	.770	15-1/2 ± 1
WDS-9, INT-600D	270 050 R91	1500 ± 10	1635 ± 30	9	267 711 R91	.750	16 ± 1
WDRS-9	270 052 R91	1500 ± 10	1635 ± 30	9	267 711 R91	.750	16 ± 1
UD-350	270 059 R91	1800 ± 10	1960 ± 30	9	264 828 R91 276 468 R91	.750 .770	17 ± 1 17-1/2 ± 1
UD-370	270 082 R91	1800 ± 10	1960 ± 30	9	274 495 R91	.750	17 ± 1
TD-14A and TD-14A (141)	270 124 R91	1400 ± 10	1525 ± 30	9	264 828 R91 266 073 R91	.750 .770	17 ± 1 17-1/2 ± 1
TD-14 (142)	270 131 R91	1650 ± 10	1800 ± 30	9	275 680 R91 274 495 R91	.750 .750	20 ± 1 17 ± 1
UD-14A	270 100 R91	1400 ± 10	1525 ± 30	9	264 828 R91 266 073 R91	.750 .770	17 ± 1 17-1/2 ± 1
UD-461	270 136 R91	1650 ± 10	1800 ± 30	9	274 495 R91	.750	17 ± 1
UD-525	270 150 R91	1800 ± 10	1960 ± 30	9	272 595 R91	.750	18-1/2 ± 1

PRINTED IN UNITED STATES OF AMERICA

FOR "B" PUMPS - IH Single and Twin Plunger

FUEL DELIVERY AND TORQUE ARM ADJUSTMENT CHART - STANDARD APPLICATIONS

NOTE: When two governor spring numbers are listed for the same pump number, the second number indicates the governor spring used when the model is equipped with open type nozzles. All others use same governor spring for orifice type or open type nozzles.

Model	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from average delivery, in cc	‡ Torque Control Adjustment: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Overload gap	7 †High idle gap .005: Orifice	7 †High idle gap .005: Open	Torque Springs: Number reqd.	Part no.	Thickness
TD-6	61	-	± 3	7/16	39/64 ± 1/32	5/64 ± 1/32	.115	-	8	260 907 R2	.014
TD-6 (61)	-	53	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.085	8	260 907 R2	.014
Super MD, MDV, WD-6, FAR 400D, DHC, INT-400D	69	54	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	.081	.081	8	260 907 R2	.014
D-281-FAR-450D-DHC, INT-450D	-	58	± 3	7/16	19/32 ± 1/32	1/32 ± 1/64	-	.085	8	260 907 R2	.014
UD-264	69	53	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	.067	.067	8	260 907 R2	.014
UD-281-4	-	53	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.085	8	260 907 R2	.014
TD-9	65	-	± 3	7/16	41/64 ± 1/32	5/64 ± 1/64	.075	-	7	260 907 R2	.014
TD-9 (91)	-	71	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.105	7	260 907 R2	.014
WD-9, ID-9, WDR-9	65	-	± 3	7/16	41/64 ± 1/32	5/64 ± 1/64	.075	-	7	260 907 R2	.014
UD-9A	70	-	± 3	7/16	41/64 ± 1/32	5/64 ± 1/64	.095	-	7	260 907 R2	.014
WDS-9, INT-600D	79	71	± 3	7/16	41/64 ± 1/32	3/64 ± 1/64	.108	.108	7	260 907 R2	.014
WDRS-9	79	71	± 3	7/16	41/64 ± 1/32	3/64 ± 1/64	.108	.108	7	260 907 R2	.014
UD-350	69	65	± 3	7/16	39/64 ± 1/32	1/64 ± 1/64	.095	.095	7	260 907 R2	.014
UD-370	-	74	± 3	7/16	5/8 ± 1/32	1/32 ± 1/64	-	-	7	260 907 R2	.014
TD-14A and TD-14A (141)	91	80	± 3	3/8	39/64 ± 1/32	3/64 ± 1/64	.095	.078	10	259 736 R3	.010
TD-14 (142)	100	89	± 3	3/8	19/32 ± 1/32	1/64 ± 1/64	.092	.078	10	259 736 R3	.010
UD-14A	91	80	± 3	3/8	39/64 ± 1/32	3/64 ± 1/64	.095	.078	10	259 736 R3	.010
UD-461	-	89	± 3	3/8	19/32 ± 1/32	1/64 ± 1/64	-	.078	10	259 736 R3	.010
UD-525	77	77	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	.115	.115	7	260 907 R2	.014

† Indicates the gap between the torque arm and the torque arm stop screw at governed high idle speed. On old type bumper springs, this measurement must be taken with bumper spring removed unless high idle gap tool 1 020 121 R91 is used.

‡ These dimensions should also be used in the procedure for setting IH single plunger pumps on Bosch test stands.

FOR "B" PUMPS - IH Single and Twin Plunger

GOVERNOR SPEED CHANGE CHART - STANDARD APPLICATIONS

Model	Pump part no.	Normal governed engine speed (rpm) at test load and wide open governor	Governed high idle speed (rpm)	Regulation percent	Governor spring assembly	Outer Spring	
						Outside diameter	Number of coils
TD-15	270 167 R91	1650 ± 10	1800 ± 30	9	269 295 R91	.750	23 ± 1
TD-15 Drott front end loader	270 168 R91	1650 ± 10	1800 ± 30	9	269 295 R91	.750	23 ± 1
UD-554	270 169 R91	1800 ± 10	1960 ± 30	9	277 023 R91	.750	20 ± 1
TD-18	270 202 R91	1300 ± 10	1445 ± 30	11	256 786 R91	.7305	27 ± 1
TD-18A (181)	270 200 R91	1350 ± 10	1500 ± 30	11	257 063 R91	.7305	25 ± 1
TD-18A (181) TD-18 (182)	270 231 R91	1450 ± 10	1580 ± 30	9	273 849 R91 269 295 R91	.741 .750	23 ± 1 23 ± 1
TD-18 (182) and TD-20 (200)	270 236 R91	1550 ± 10	1690 ± 30	9	273 803 R91	.741	20 ± 1
UD-18A	270 201 R91	1600 ± 10	1775 ± 30	11	257 064 R91	.741	24 ± 1
UD-691	270 244 R91	1600 ± 10	1745 ± 30	9	272 595 R91	.750	18-1/2 ± 1
TD-24	270 262 R91	1400 ± 10	1525 ± 30	9	267 228 R91	.7305	18-1/4 ± 1
TD-24 (241)	270 283 R91	1500 ± 10	1635 ± 30	9	277 906 R91	.741	24 ± 1
TD-24 T. C.	270 285 R91	1500 ± 10	1635 ± 30	9	277 906 R91	.741	24 ± 1
UD-1091	270 262 R91	1400 ± 10	1525 ± 30	9	267 228 R91	.7305	18-1/4 ± 1
UD-1091	270 283 R91	1500 ± 10	1635 ± 30	9	277 906 R91	.741	24 ± 1
TD-6-424 Drott front end loader	270 023 R91	1650 ± 10	1800 ± 30	9	276 465 R91	.750	16 ± 1
TD-6 (61)-450-0 Mine tractor	270 030 R91	1650 ± 10	1800 ± 30	9	276 465 R91	.750	16 ± 1
TD-9-424-0 Drott front end loader -9K3A	270 075 R91	1650 ± 10	1800 ± 30	9	275 680 R91	.750	20 ± 1
TD-9 Mine tractor	270 076 R91	1400 ± 10	1525 ± 30	9	267 711 R91	.750	16 ± 1
TD-9 (91)-450-0 with Drott 9K-3A loader	270 080 R91	1650 ± 10	1800 ± 30	9	275 680 R91	.750	15 ± 1

PRINTED IN UNITED STATES OF AMERICA

FOR "B" PUMPS - IH Single and Twin Plunger

FUEL DELIVERY AND TORQUE ARM ADJUSTMENT CHART - STANDARD APPLICATIONS

NOTE: When two governor spring numbers are listed for the same pump number, the second number indicates the governor spring used when the model is equipped with open type nozzles. All others use same governor spring for orifice type or open type nozzles.

Model	Av. del. in cc at 550 rpm for 550 revolutions, Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions, Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from average delivery, in cc	‡ Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Overload gap	7 † High idle gap ± .005: Orifice	7 † High idle gap ± .005: Open	Torque Spring: Number reqd.	Torque Spring: Part no.	Torque Spring: Thickness
TD-15	-	66	±3	7/16	5/8 ± 1/32	3/64 ± 1/64		105	7	260 907 R2	.014
TD-15 Drott front end loader	-	75	± 4	7/16	5/8 ± 1/32	3/64 ± 1/64	-	118	7	260 907 R2	.014
UD-554	-	82	± 4	7/16	5/8 ± 1/32	3/64 ± 1/64	-	-	7	260 907 R2	.014
TD-18	92	-	± 4	7/16	39/64 ± 1/32	1/16 ± 1/64	.105	-	7	260 907 R2	.014
TD-18A (181)	94	89	± 4	7/16	37/64 ± 1/32	5/64 ± 1/64	.105	-	7	260 907 R2	.014
TD-18A (181) TD-18 (182)	98	94	± 4	7/16	41/64 ± 1/32	1/32 ± 1/64	.090	.090	7	260 907 R2	.014
TD-18 (182) and TD-20 (200)	-	95	± 4	7/16	37/64 ± 1/32	1/64 ± 1/64	-	.090	7	260 907 R2	.014
UD-18A	94	89	± 4	7/16	37/64 ± 1/32	1/16 ± 1/64	.105	.105	7	260 907 R2	.014
UD-691	-	94	± 4	7/16	5/8 ± 1/32	1/64 ± 1/64	-	.110	7	260 907 R2	.014
TD-24	128 §	117	± 5	7/16	19/32 ± 1/32	3/64 ± 1/64	.140	-	7	260 907 R2	.014
TD-24 (241)	-	121	± 5	7/16	19/32 ± 1/32	3/64 ± 1/64	-	.156	7	260 907 R2	.014
TD-24 T. C.	-	121	± 5	7/16	19/32 ± 1/32	3/64 ± 1/64	-	.156	7	260 907 R2	.014
UD-1091	128 §	117	± 5	7/16	19/32 ± 1/32	3/64 ± 1/64	.140	.140	7	260 907 R2	.014
UD-1091	-	121	± 5	7/16	19/32 ± 1/32	3/64 ± 1/64	-	.156	7	260 907 R2	.014
TD-6-424 Drott front end loader	-	71	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.080	8	260 907 R2	.014
TD-6 (61)-450-0 Mine tractor	-	95	± 4	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.080	8	260 907 R2	.014
TD-9-424-0 Drott front end loader -9K3A	-	71	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.102	7	260 907 R2	.014
TD-9 Mine tractor	-	61	± 3	7/16	41/64 ± 1/32	1/16 ± 1/64	-	.093	7	260 907 R2	.014
TD-9 (91)-450-0 with Drott 9K-3A loader	-	71	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.102	7	260 907 R2	.014

† Indicate the gap between the torque arm and the torque arm stop screw at governed high idle speed. On old type bumper springs, this measurement must be taken with bumper spring removed unless high idle gap tool 1 020 121 R91 is used.

‡ These dimensions should also be used in the procedure for setting IH single plunger pumps on Bosch test stands.

§ On some test benches already equipped with 100 cc beakers, it will be necessary to run the test bench at 550 rpm for 1/2 minute, to obtain 1/2 the delivery listed above.

FOR "B" PUMPS - IH Single and Twin Plunger

GOVERNOR SPEED CHANGE CHART - STANDARD APPLICATIONS

Model	Pump part no.	Normal Governed engine speed (rpm) at test load and wide open governor	Governed high idle speed (rpm)	Regulation percent	Governor spring assembly	Outer Spring	
						Outside diameter	Number of coils
TD-9 (91)-250-0 with 9D-4 bulldozer	270 081 R91	1550 ± 10	1690 ± 30	9	265 509 R91	.750	15 ± 1
TD-15-500-0 with welding equipment	270 170 R91	2000 ± 10	2070 ± 30	5 Max.	277 023 R91	.750	20 ± 1
TD-15-600-0 Dual Welder Tractor	270 172 R91	1725 ± 10	1810 ± 30	5	273 849 R91	.741	23 ± 1
TD-18 (182) Drott front end loader	270 232 R91	1600 ± 10	1745 ± 30	9	273 803 R91	.741	20 ± 1
TD-18-502 Lincoln Welding Eqpt.	270 237 R91	1450 ± 10	1495 ± 10	3	275 056 R91	.730	19 ± 1
TD-20 (200) Superior Eqpt. Co. welding equipment	270 241 R91	1550 ± 10	1595 ± 10	-	305 207 R91	.7305	18-1/4 ± 1
TDT-24 special	270 287 R91	1500 ± 10	1635 ± 25	9	269 509 R91	.7305	17 ± 1

FOR "C" PUMPS – Twin Plunger

UD-817	270 431 R91	2100 ± 10	2245 ± 40	7	272 595 R91	.750	18-1/2 ± 1
UDT-817	270 430 R91	2100 ± 10	2245 ± 40	7	308 351 R91	.741	22
UDT-817 H-120 Payloader	270 439 R91	2100 ± 10	2245 ± 30	7	277 023 R91	.750	20 ± 1
UDT-817	270 440 R91	2100 ± 10	2245 ± 40	7	318 254 R91	.741	22 ± 1
PH-65 (652)	270 433 R91	2100 ± 10	2245 ± 40	7	272 595 R91	.750	18-1/2 ± 1
PH-95 (952), 295 payscraper and 495 payscraper	270 432 R91	2100 ± 10	2245 ± 40	7	308 351 R91	.741	22 ± 1
TD-25	270 434 R91	1500 ± 10	1635 ± 30	9	269 569 R91	.741	23 ± 1
TD-25 (torque conv.)	270 435 R91	1500 ± 10	1635 ± 30	9	269 569 R91	.741	23 ± 1

PRINTED IN UNITED STATES OF AMERICA

FOR "B" PUMPS - IH Single and Twin Plunger

FUEL DELIVERY AND TORQUE ARM ADJUSTMENT CHART - STANDARD APPLICATIONS

NOTE: When two governor spring numbers are listed for the same pump number, the second number indicates the governor spring used when the model is equipped with open type nozzles. All others use same governor spring for orifice type or open type nozzles.

Model	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from average delivery, in cc	‡ Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Overload gap	7 † High idle gap ± .005: Orifice	7 † High idle gap ± .005: Open	Torque Springs: Number reqd.	Torque Springs: Part no.	Torque Springs: Thickness
TD-9 (91)-250-0 with 9D-4 bulldozer	-	71	± 3	7/16	5/8 ± 1/32	3/64 ± 1/64	-	.105	7	260 907 R2	014
TD-15-500-0 with welding equipment	-	74	± 3	7/16	5/8 ± 1/32	1/32 ± 1/64	-	-	7	260 907 R2	.014
TD-15-600-0 Dual Welder Tractor	-	82	± 4	7/16	5/8 ± 1/32	1/32 ± 1/64	-	.119	7	260 907 R2	.014
TD-18 (182) Drott front end loader	-	94	± 4	7/16	5/8 ± 1/32	1/64 ± 1/64	-	.110	7	260 907 R2	.014
TD-18-502 Lincoln Welding Eqpt.	-	94	± 4	7/16	19/32 ± 1/32	1/32 ± 1/64	-	.090	7	260 907 R2	.014
TD-20 (200) Superior Eqpt. Co. welding equipment	-	95	± 4	7/16	19/32 ± 1/32	1/32 ± 1/64	-	.090	7	260 907 R2	.014
TDT-24 special	-	146	± 5	7/16	39/64 ± 1/32	1/64 ± 1/64	-	.173	7	260 907 R2	.014

FOR "C" PUMPS - Twin Plunger - Standard and Special Applications

UD-817		81	± 4	7/16	11/16 ± 1/32	3/64 ± 1/64	-	.057	5	260 907 R2	.014
UDT-817	-	132	± 5	7/16	21/32 ± 1/32	5/64 ± 1/64	-	.120	4	260 907 R2	.014
UDT-817 H-120 Payloader	-	-	-	7/16	43/64 ± 1/32	1/32 ± 1/64	-	.090	4	260 907 R2	.014
UDT-817	-	-	-	7/16	21/32 ± 1/32	5/64 ± 1/64	-	.120	4	260 907 R2	.014
PH-65 (652)	-	84	± 4	7/16	11/16 ± 1/32	3/64 ± 1/64	-	.057	5	260 907 R2	.014
PH-95 (952), 295 payscraper and 495 payscraper	-	132	± 5	7/16	21/32 ± 1/32	5/64 ± 1/64	-	.120	4	260 907 R2	.014
TD-25	-	123	± 5	7/16	47/64 ± 1/32	5/64 ± 1/64	-	.120	4	260 907 R2	.014
TD-25 (torque conv.)	-	123	± 5	7/16	47/64 ± 1/32	5/64 ± 1/64	-	.120	4	260 907 R2	.014

† Indicates the gap between the torque arm and the torque arm stop screw at governed high idle speed. On old type bumper springs, this measurement must be taken with bumper spring removed unless high idle gap tool 1 020 121 R91 is used.

‡ These dimensions should also be used in the procedure for setting IH single plunger pumps on Bosch test stands.

FOR "A" and "B" PUMPS - Single Plunger - "35" and "40" Series Engines

Model	Normal Governed Engine rpm and Speed Regulation Percentage	Governed Fast Idle Speed ±25	Injection Pump Number "A"	Injection Pump Number "B"	Governor Spring Assembly	Av. del. in cc at 550 rpm for 550 revolutions	Max. Permissible variation of any Nozzle from Average Del. in c.c.	Torque Control Adjustments			
								1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Overload Gap ±.020	7 High Idle ± .005
TD-40, PD-40, WD-40, ID-40	1200 - 11%	1330	258 596 R92	270 418 R91	257 134 R91	76	± 3	3/8	39/64	.047	.050
TD-40, WD-40	1100 - 11%	1220	258 597 R92	270 419 R91	67 382 D	69	± 3	3/8	39/64	.031	.060
TD-40, PD-40, WD-40, ID-40	1200 - 11%	1330	258 598 R92	270 420 R91	257 134 R91	76	± 3	7/16	5/8	.062	.095
TD-40, WD-40	1100 - 11%	1220	258 599 R92	270 421 R91	67 382 D	69	± 3	7/16	9/16	.031	.095
TD-35 10° and 45° heads	1100 - 11%	1220	258 600 R92	270 422 R91	67 389 D	66	± 3	3/8	39/64	.062	.050
PD-40	1250 - 11%	1390	258 601 R92	270 423 R91	257 134 R91	76	± 3	3/8	39/64	.047	.050
PD-40	1250 - 11%	1390	258 602 R92	270 424 R91	257 134 R91	76	± 3	7/16	5/8	.062	.095

ISS-1012-Y. 3-61.

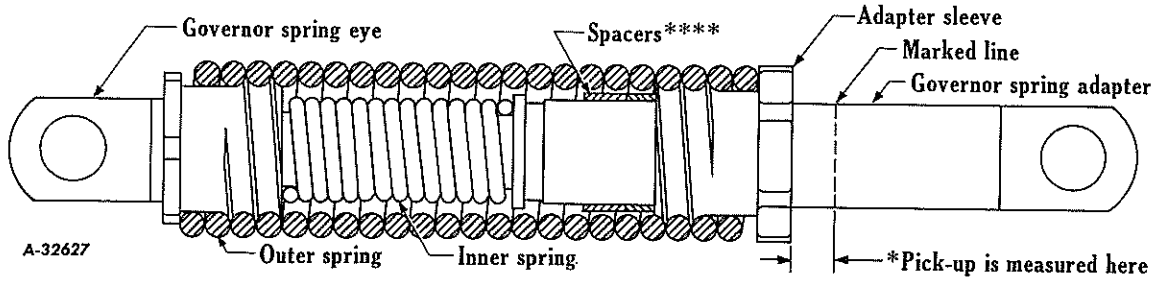
PRINTED IN UNITED STATES OF AMERICA

ALTITUDE DERATION

A given quantity of fuel must be mixed with a specific amount of oxygen to burn completely and efficiently. An engine which burns fuel efficiently at a low altitude will run with a heavy exhaust smoke at altitudes above 4000 ft. because there is less oxygen in the atmosphere and combustion is incomplete. The fuel and oxygen mixture is too rich in fuel. To bring the fuel-to-oxygen ratio again within the efficient range, the amount of fuel injected must be decreased. This is called "altitude deration."

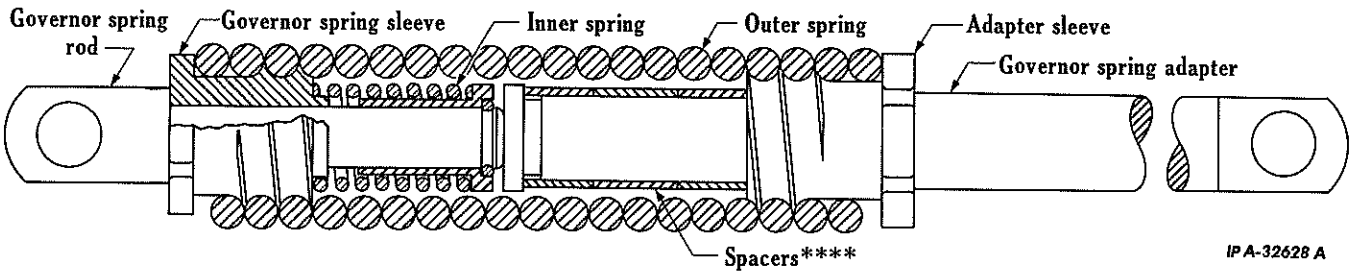
Generally, most engines will not require deration below 4000 ft. altitude. However, since there are many power ratings for enengines of the same series, as well as various speeds, all engines do not require deration at the same altitudes. The need for deration will be indicated by a heavy exhaust smoke while operating the engine under load at the intended altitude of operation.

If deration is required, turn the fuel rack adjusting nut counterclockwise 1/3 of a turn at a time until the exhaust is clear as possible at rated powers and speeds. Be sure to lock the rack after each adjustment.



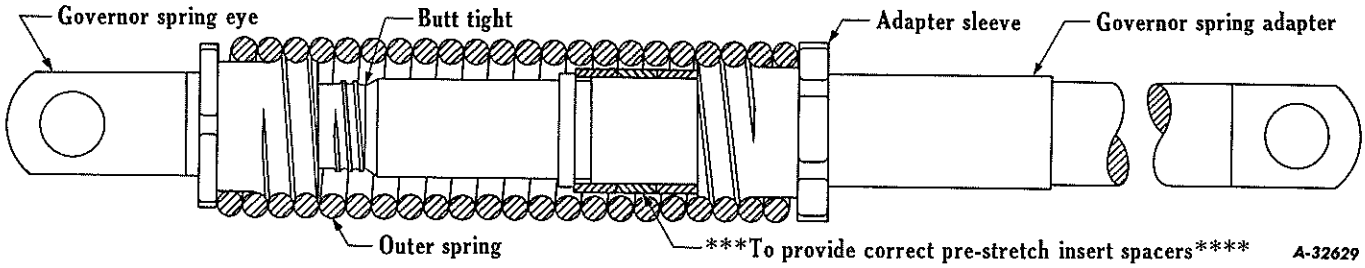
Illust. 1 - Tension Type Inner Spring.

* To measure pick-up, mark a line, on the governor spring adapter, next to the adapter sleeve. Hold the governor spring eye and pull the adapter until the outer spring just starts to stretch. While holding the governor spring in this position, measure the space between the adapter sleeve and the marked line. This will give the pick-up gap. If the gap is incorrect, add or remove spacers **** as necessary.



Illust. 2 - Compression Type Inner Spring.

**** Insert spacers to take up all play between governor spring rod and inner governor spring rod.



Illust. 3 - No Inner Spring.

*** When measuring pre-stretch, measure the free length of the outer spring and then add enough spacers **** to stretch the outer spring the specified amount.

**** The following spacers are used as required, to obtain correct pick-up or pre-stretch:

59 757 D - 1/8 inch long	67 233 D - 1/32 inch long	67 235 D - 3/8 inch long
59 758 D - 1/16 inch long	67 234 D - 1/4 inch long	

PRINTED IN UNITED STATES OF AMERICA

GOVERNOR SPRING ASSEMBLY

.0915 Outer Spring Wire Diameter

Governor Spring Assembly Number	Outer Spring Number	Inner Spring Number	Outer Spring Number of Coils ± 1	Outer Spring Outside Diameter	Outer Spring Inside Diameter	Pick-Up +0 -1/32 Illusts. 1 & 2, page 44	Pre-Stretch Illust. 3, page 44	Injection Pump	
								Single Plunger	Twin Plunger
67 384 D	67 210 D	67 208 D	25	.718	.535	5/32	——	x	
257 065 R91	67 210 D	67 208 D	25	.718	.535	5/32	——		x
257 712 R91	67 210 D	67 208 D	25	.718	.535	3/16	——		x
67 885 D	67 884 D	67 208 D	22	.718	.535	5/32	——	x	
256 652 R91	67 884 D	67 208 D	22	.718	.535	3/16	——		x
257 110 R91	67 884 D	None	22	.718	.535	——	1/8		x
257 456 R91	67 884 D	None	22	.718	.535	——	None		x
257 107 R91	257 111 R1	67 208 D	33	.718	.535	5/32	——		x
264 236 R91	257 111 R1	67 208 D	33	.718	.535	3/16	——		x
257 108 R91	257 112 R1	None	22	.718	.535	——	1/8		x
257 125 R91	257 127 R1	None	20	.718	.535	——	None		x
257 135 R91	257 127 R1	67 208 D	20	.718	.535	5/32	——		x
260 690 R91	257 127 R1	None	20	.718	.535	——	1/32		x
267 181 R91	267 180 R1	67 208 D	23	.718	.535	5/32	——		x

GOVERNOR SPRING ASSEMBLY

.1055 Outer Spring Wire Diameter

Governor spring assembly number	Outer spring number	Inner spring number	Outer spring number of coils ±1	Outer spring outside diameter	Outer spring inside diameter	Pick-up + 0 - 1/32 Illust. 1 & 2, page 44	Pre-stretch Illust. 3 page 44	Injection Pump	
								Single plunger	Twin plunger
67 391 D	66 427 D	None	23	.7305	.5195	--	None	x	
67 395 D	66 427 D	67 208 D	23	.7305	.5195	5/32	-	x	
257 105 R91	66 427 D	67 208 D	23	.7305	.5195	5/32	-		x
257 721 R91	66 427 D	67 208 D	23	.7305	.5195	3/16	-		x
262 168 R91	66 427 D	None	23	.7305	.5195	--	None		x
264 208 R91	66 427 D	None	23	.7305	.5195	--	3/16		x
265 335 R91	66 427 D	None	23	.7305	.5195	--	None		x
267 652 R91	66 427 D	None	23	.7305	.5195	--	3/16	x	
272 149 R91	66 427 D	264 760 R1	23	.7305	.5195	--	-		x
274 776 R91	66 427 D	272 594 R1	23	.7305	.5195	--	-	x	
67 390 D	67 223 D	None	27	.7305	.5195	--	None	x	
256 786 R91	67 223 D	67 208 D	27	.7305	.5195	3/16	-		x
257 109 R91	67 223 D	None	27	.7305	.5195	--	None		x
261 346 R91	67 223 D	67 208 D	27	.7305	.5195	5/32	-	x	
67 381 D	67 230 D	67 208 D	19	.7305	.5195	5/32	-	x	
67 385 D	67 230 D	None	19	.7305	.5195	--	None	x	
261 347 R91	67 230 D	None	19	.7305	.5195	--	5/32	x	
261 379 R91	67 230 D	None	19	.7305	.5195	--	1/8	x	
264 314 R91	67 230 D	None	19	.7305	.5195	--	None		x
266 808 R91	67 230 D	67 208 D	19	.7305	.5195	3/16	-		x
269 407 R91	67 230 D	264 760 R1	19	.7305	.5195	--	-		x
275 056 R91	67 230 D	272 594 R1	19	.7305	.5195	--	-		x
67 392 D	67 261 D	67 208 D	29	.7305	.5195	5/32	-	x	
261 097 R91	67 261 D	67 208 D	29	.7305	.5195	5/32	-		x
67 388 D	67 263 D	67 208 D	25	.7305	.5195	5/32	-	x	
257 063 R91	67 263 D	67 208 D	25	.7305	.5195	5/32	-		x
257 106 R91	67 263 D	None	25	.7305	.5195	--	None		x
262 169 R91	67 263 D	None	25	.7305	.5195	--	3/16		x

ISS-1012-Y. 3-61.

PRINTED IN UNITED STATES OF AMERICA

GOVERNOR SPRING ASSEMBLY

.1055 Outer Spring Wire Diameter

Governor spring assembly number	Outer spring number	Inner spring number	Outer spring number of coils ± 1	Outer spring outside diameter	Outer spring inside diameter	Pick-up + 0 - 1/32 Illust. 1 & 2, page 44	Pre-stretch Illust. 3 page 44	Injection Pump	
								Single plunger	Twin plunger
68 528 D	68 527 D	None	17	.7305	.5195	-	None	x	
257 124 R91	68 527 D	67 208 D	17	.7305	.5195	5/32	-		x
258 204 R91	68 527 D	67 208 D	17	.7305	.5195	5/32	-	x	
261 100 R91	68 527 D	None	17	.7305	.5195	-	1/8	x	
265 512 R91	68 527 D	264 760 R1	17	.7305	.5195	-	-	x	
269 509 R91	68 527 D	264 760 R1	17	.7305	.5195	-	-		x
268 998 R91	68 527 D	None	17	.7305	.5195	-	None		x
69 739 D	69 740 D	None	18-1/4	.7305	.5195	-	None	x	
267 228 R91	69 740 D	264 760 R1	18-1/4	.7305	.5195	-	-		x
271 611 R91	69 740 D	None	18-1/4	.7305	.5195	-	1/6		x
305 207 R91	69 740 D	272 594 R1	18-1/4	.7305	.5195	-	-		x
69 807 D	69 806 D	None	20	.7305	.5195	-	None	x	
257 123 R91	69 806 D	67 208 D	20	.7305	.5195	5/32	-		x
254 841 R91	69 806 D	67 208 D	20	.7305	.5195	5/32	-	x	
267 221 R91	69 806 D	264 760 R1	20	.7305	.5195	-	-		x
267 221 R93	69 806 D	272 594 R1	20	.7305	.5195	-	-		x
250 118 R91	250 117 R1	None	24-1/2	.7305	.5195	-	None	x	
261 104 R91	250 117 R1	67 208 D	24-1/2	.7305	.5195	5/32	-	x	
262 189 R91	250 117 R1	67 208 D	24-1/2	.7305	.5195	5/32	-	x	
264 764 R91	250 117 R1	None	24-1/2	.7305	.5195	-	None		x
257 656 R91	257 655 R1	67 208 D	28	.7305	.5195	5/32	-		x
261 016 R91	257 655 R1	None	28	.7305	.5195	-	None		x
271 444 R91	257 655 R1	None	28	.7305	.5195	-	1/16		x
252 961 R91	67 838 D	67 208 D	21	.7305	.5195	5/32	-	x	
252 962 R91	67 838 D	None	21	.7305	.5195	-	None	x	
258 355 R91	67 838 D	67 208 D	21	.7305	.5195	5/32	-		x
261 348 R91	67 838 D	None	21	.7305	.5195	-	3/16	x	
261 338 R91	67 838 D	None	21	.7305	.5195	-	None		x
264 821 R91	264 820 R1	None	25	.7305	.5195	-	None		x

GOVERNOR SPRING ASSEMBLY

.1205 Outer Spring Wire Diameter

Governor spring assembly number	Outer spring number	Inner spring number	Outer spring number of coils ±1	Outer spring outside diameter	Outer spring inside diameter	Pick-up +0 -1/32 Illust. 1 & 2, Page 44	Pre-stretch Illust. 3, Page 44	Injection Pump	
								Single plunger	Twin plunger
67 387 D	67 231 D	67 208 D	24	.741	.500	5/32	—	x	
255 408 R91	67 231 D	None	24	.741	.500	—	None	x	
257 064 R91	67 231 D	67 208 D	24	.741	.500	5/32	—		x
261 102 R91	67 231 D	None	24	.741	.500	—	1/8	x	
262 820 R91	67 231 D	None	24	.741	.500	—	3/32	x	
262 858 R91	67 231 D	None	24	.741	.500	—	None		x
263 029 R91	67 231 D	None	24	.741	.500	—	1/32	x	
269 510 R91	67 231 D	264 760 R1	24	.741	.500	—	—		x
272 596 R91	67 231 D	264 760 R1	24	.741	.500	—	—	x	
277 906 R91	67 231 D	272 594 R1	24	.741	.500	—	—		x
70 248 D	70 247 D	None	15-1/2	.741	.500	—	7/32	x	
261 052 R91	261 050 R1	67 208 D	20	.741	.500	5/32	—	x	
261 527 R91	261 050 R1	67 208 D	20	.741	.500	5/32	—		x
261 531 R91	261 050 R1	67 208 D	20	.741	.500	5/32	—	x	
262 167 R91	261 050 R1	None	20	.741	.500	—	3/16	x	
262 772 R92	261 050 R1	264 760 R1	20	.741	.500	—	—		x
264 767 R91	261 050 R1	264 760 R1	20	.741	.500	—	—	x	
273 803 R91	261 050 R1	272 594 R1	20	.741	.500	—	—	x	
263 853 R91	263 854 R1	None	23	.741	.500	—	None	x	
268 028 R91	263 854 R1	None	23	.741	.500	—	1/8	x	
268 106 R91	263 854 R1	264 760 R1	23	.741	.500	—	—	x	
269 569 R91	263 854 R1	264 760 R1	23	.741	.500	—	—		x
273 849 R91	263 854 R1	272 594 R1	23	.741	.500	—	—		x
308 351 R91	308 352 R1	272 594 R1	22	.741	.500	—	—		x

ISS-1012-Y. 3-61.
PRINTED IN UNITED STATES OF AMERICA

GOVERNOR SPRING ASSEMBLY

.125 Outer Spring Wire Diameter

Governor spring assembly number	Outer spring number	Inner spring number	Outer spring number of coils ±1	Outer spring outside diameter	Outer spring inside diameter	Pick-up +0 -1/32 Illust. 1 & 2, Page 44	Pre-stretch Illust. 3, Page 44	Injection Pump	
								Single plunger	Twin plunger
67 389 D	59 752 DA	67 208 D	20	.750	.500	5/32	—	x	
257 066 R91	59 752 DA	67 208 D	20	.750	.500	5/32	—		x
265 511 R91	59 752 DA	264 760 R1	20	.750	.500	—	—	x	
268 472 R91	59 752 DA	264 760 R1	20	.750	.500	—	—		x
275 680 R91	59 752 DA	272 594 R1	20	.750	.500	—	—	x	
277 023 R91	59 752 DA	272 594 R1	20	.750	.500	—	—		x
253 258 R91	63 751 D	67 208 D	17	.750	.500	5/32	—	x	
257 720 R91	63 751 D	67 208 D	17	.750	.500	5/32	—		x
263 848 R91	63 751 D	None	17	.750	.500	—	1/8	x	
264 828 R91	63 751 D	264 760 R1	17	.750	.500	—	—	x	
269 568 R91	63 751 D	264 760 R1	17	.750	.500	—	—		x
274 495 R91	63 751 D	272 594 R1	17	.750	.500	—	—	x	
67 382 D	67 257 D	67 208 D	23	.750	.500	5/32	—	x	
260 729 R91	67 257 D	None	23	.750	.500	—	3/16	x	
261 101 R91	67 257 D	67 208 D	23	.750	.500	5/32	—	x	
269 098 R91	67 257 D	264 760 R1	23	.750	.500	—	—	x	
269 295 R91	67 257 D	264 760 R1	23	.750	.500	—	—		x
70 264 D	70 263 D	67 208 D	15	.750	.500	5/32	—	x	
258 782 R91	70 263 D	67 208 D	15	.750	.500	5/32	—		x
262 890 R91	70 263 D	None	15	.750	.500	—	None	x	
265 509 R91	70 263 D	264 760 R1	15	.750	.500	—	—	x	
274 462 R91	70 263 D	272 594 R1	15	.750	.500	—	—	x	
257 122 R91	257 126 R1	67 208 D	18-1/2	.750	.500	5/32	—		x
257 134 R91	257 126 R1	67 208 D	18-1/2	.750	.500	5/32	—	x	
265 510 R91	257 126 R1	264 760 R1	18-1/2	.750	.500	—	—	x	
272 595 R91	257 126 R1	272 594 R1	18-1/2	.750	.500	—	—		x
267 711 R91	267 770 R1	264 760 R1	16	.750	.500	—	—	x	
276 465 R91	267 770 R1	272 594 R1	16	.750	.500	—	—	x	

INDEX TO
GOVERNOR SPEED CHANGE, FUEL DELIVERY
AND TORQUE ARM ADJUSTMENT CHARTS
IH FUEL INJECTION PUMPS
SPECIAL APPLICATIONS-MANUFACTURER CUSTOMERS' UNITS

ISS-1012-Y. 3-61.

PRINTED IN UNITED STATES OF AMERICA

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNIT

6 Series Engines (Not increased horsepower)

Model	Normal Gov. Engine RPM and Speed Reg. Percentage *	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ±.030	7 High Idle Gap ±.005
MD	1450 - 11%	1610 ± 30	65 306 DA 1 65 306 DA 101	253 258 R91	53	±3	3/8	37/64	3/64	.090
IUD-6	1450 - 11%	1610 ± 30	65 306 DA 3 65 306 DA 103	253 258 R91	53	±3	3/8	37/64	3/64	.090
UD-6	1500 - 11%	1665 ± 30	65 306 DA 4 65 306 DA 104	253 258 R91	53	±3	3/8	37/64	3/64	.090
UD-6	1200 - 11%	1330 ± 25	65 306 DA 6 65 306 DA 106	67 382 D	53	±3	3/8	37/64	1/16	.109
UD-6	1400 - 11%	1555 ± 30	65 306 DA 7 65 306 DA 107	253 258 R91	53	±3	7/16	5/8	1/16	.097
UD-6	1350 - 11%	1500 ± 30	65 306 DA 9 65 306 DA 109	67 382 D	-	-	7/16	5/8	1/16	.094
UD-6	1600 - 11%	1775 ± 30	65 306 DA 10 65 306 DA 110	254 839 R91	-	-	3/8	37/64	1/16	.085
UD-6	900 - 11%	1000 ± 25	65 306 DA 12 65 306 DA 112	67 384 D	-	-	5/8	37/64	1/32	.100
UD-6	1100 - 11%	1220 ± 25	65 306 DA 13 65 306 DA 113	67 381 D	53	±3	3/8	37/64	1/16	.125
UD-6	1300 - 11%	1445 ± 30	65 306 DA 14 65 306 DA 114	67 381 D	-	-	7/16	5/8	1/16	.090
UD-6	1320 - 11%	1465 ± 30	65 306 DA 15 65 306 DA 115	253 258 R91	53	±3	3/8	37/64	3/64	.074
UD-6	1200 - 11%	1330 ± 25	65 306 DA 16 65 306 DA 116	257 134 R91	53	±3	3/8	37/64	1/32	.072
UD-6	1400 - 11%	1555 ± 30	65 306 DA 17 65 306 DA 117	67 383 D	53	±3	3/8	37/64	3/64	.074
UD-6	1600 - 11%	1775 ± 30	65 306 DA 18 65 306 DA 118	254 839 R1	53	±3	3/8	19/32	1/64	.070
UD-6	1250 - 11%	1385 ±25	65 306 DA 19 65 306 DA 119	67 382 D	53	±3	3/8	39/64	3/32	.097
UD-6	1200 - 5% max.	1260	65 306 DA 20 65 306 DA 120	261 346 R91	-	-	3/8	37/64	1/16	.095
UD-6	1000 - 5% max.	1050	65 306 DA 23 65 306 DA 123	67 384 D	-	-	3/8	37/64	1/16	.095
UD-6	1100 - 5% max.	1155	65 306 DA 25 65 306 DA 125	67 392 D	-	-	3/8	37/64	1/16	.095
IUD-6	1800 - 11%	2000 ±30	65 306 DA 126	69 855 D	-	-	3/8	39/64	3/32	.090
UD-6	1600 - 11%	1775 ±30	65 306 DA 129	254 839 R91	-	-	7/16	41/64	3/32	.090
UD-6	1220 - 5%	1300 max.	65 306 DA 44 65 306 DA 144	67 385 D	53	±3	5/8	1/2	± 0.000	.095

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

6 Series Engines (Increased horsepower)

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per. variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS 1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ±.030	7 High Idle Gap ±.005
UD-6A	1500 - 11%	1665 ± 30	65 306 DA 204	253 258 R91	61	± 3	7/16	5/8	3/32	.090
UD-6A	1200 - 11%	1330 ± 25	65 306 DA 206	67 387 D	61	± 3	7/16	5/8	1/16	.105
UD-6A	1400 - 11%	1555 ± 30	65 306 DA 207	67 389 D	61	± 3	7/16	41/64	5/64	.095
UD-6A	1100 - 11%	1220 ± 25	65 306 DA 213	67 395 D	61	± 3	7/16	5/8	1/16	.120
UD-6A	1320 - 11%	1465 ± 30	65 306 DA 215	253 258 R91	61	± 3	7/16	41/64	3/32	.085
UD-6A	1200 - 11%	1330 ± 25	65 306 DA 216	261 531 R91	59	± 3	7/16	5/8	1/16	.075
UD-6A	1400 - 11%	1555 ± 30	65 306 DA 217	253 258 R91	59	± 3	7/16	5/8	1/16	.075
UD-6A	1600 - 11%	1775 ± 30	65 306 DA 218	69 855 D	59	± 3	7/16	41/64	1/16	.062
UD-6A	1250 - 11%	1385 ± 25	65 306 DA 219	67 387 D	61	± 3	7/16	41/64	1/16	.110
UD-6A	1200 - 5% max.	1260	65 306 DA 220	261 346 R91	61	± 3	7/16	5/8	1/16	.120
UD-6A	1800 - 11%	2000 ± 35	65 306 DA 230	265 535 R91	62	± 3	7/16	5/8	3/64	.103

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

264 Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS 1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ±.005
UD-264	1600 - 9%	1745 ± 30	265 404 R91	265 509 R91	69	± 3	7/16	5/8	1/16	.120
UD-264	1500 - 11%	1665 ± 30	265 405 R91	265 509 R91	58	± 3	7/16	39/64	5/64	.093
UD-264	1200 - 11%	1330 ± 25	265 406 R91	264 767 R91	58	± 3	7/16	39/64	1/32	.103
UD-264	1400 - 11%	1555 ± 30	265 407 R91	264 828 R91	60	± 3	7/16	39/64	1/16	.105
UD-264	1470 - 11%	1630 ± 30	265 409 R91	69 855 D	65	± 3	7/16	5/8	1/64	.035
UD-264	1350 - 11%	1500 ± 30	265 410 R91	265 510 R91	69	± 3	7/16	5/8	5/64	.140
UD-264	1800 - 9%	1960 ± 30	265 411 R91	271 610 R91	58	± 3	7/16	37/64	3/64	.065
UD-264	1100 - 11%	1220 ± 25	265 413 R91	264 767 R91	58	± 3	7/16	37/64	3/64	.098
UD-264	1200 - 11%	1330 ± 25	265 416 R91	265 510 R91	54	± 3	7/16	39/64	1/16	.072
UD-264	1400 - 11%	1555 ± 30	265 417 R91	265 509 R91	54	± 3	7/16	39/64	1/16	.075
UD-264	1600 - 11%	1775 ± 30	265 418 R91	265 535 R91	54	± 3	7/16	39/64	1/16	.070
UD-264	1250 - 11%	1385 ± 25	265 419 R91	265 511 R91	58	± 3	7/16	19/32	1/16	.100
UD-264	1200 - 5% max.	1260 max.	265 420 R91	265 512 R91	58	± 3	7/16	19/32	1/16	.105
UD-264	1300 - 5% max.	1365 max.	265 431 R91	268 106 R91	69	± 3	7/16	5/8	1/16	.140
UD-264	1400 - 5%	1470 ± 30	265 432 R91	264 767 R91	69	± 3	7/16	39/64	1/16	.085

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

PRINTED IN UNITED STATES OF AMERICA

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

9 Series Engines (Not increased horsepower)

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS 1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ±.030	7 High Idle Gap ± .005
UD-9	1400 - 11%	1555 ± 30	65 309 DA 1 65 309 DA 101	253 258 R91	63	± 3	7/16	5/8	1/64	.085
UD-9	1500 - 11%	1665 ± 30	65 309 DA 4 65 309 DA 104	67 383 D	63	± 3	7/16	5/8	1/64	.085
UD-9	1060 - 11%	1175 ± 25	65 309 DA 6 65 309 DA 106	67 388 D	63	± 3	7/16	5/8	1/16	.090
UD-9	1200 - 11%	1330 ± 25	65 309 DA 7 65 309 DA 107	67 382 D	-	-	7/16	5/8	1/32	.095
UD-9	1400 - 11%	1550 ± 30	65 309 DA 9 65 309 DA 109	67 389 D	-	-	7/16	5/8	3/64	.105
UD-9	1000 - 11%	1110 ± 25	65 309 DA 10 65 309 DA 110	67 388 D	-	-	7/16	5/8	3/64	.110
UD-9	1100 - 11%	1220 ± 25	65 309 DA 11 65 309 DA 111	67 395 D	-	-	7/16	5/8	1/32	.095
UD-9	1350 - 11%	1500 ± 30	65 309 DA 12 65 309 DA 112	67 382 D	-	-	7/16	5/8	1/32	.100
UD-9	1450 - 11%	1610 ± 30	65 309 DA 13 65 309 DA 113	253 258 R91	-	-	7/16	5/8	1/32	.087
UD-9	1320 - 11%	1465 ± 30	65 309 DA 14 65 309 DA 114	67 382 D	-	-	7/16	5/8	1/32	.060
UD-9	1800 - 11%	2000 ± 30	65 309 DA 15 65 309 DA 115	69 855 D	69	± 3	7/16	5/8	1/32	-
UD-9	1500 - 11%	1665 ± 30	65 309 DA 19 65 309 DA 119	254 839 R91	-	-	7/16	5/8	1/32	.056
UD-9	1200 - 5% max.	1260	65 309 DA 20 65 309 DA 120	67 395 D	-	-	1/2	43/64	1/32	.096
UD-9	1260 - 5% max.	1325	65 309 DA 21 65 309 DA 121	252 961 R91	-	-	7/16	5/8	1/16	.093
UD-9	1350 - 5% max.	1420	65 309 DA 22 65 309 DA 122	258 204 R91	-	-	1/2	11/16	3/64	.090
UD-9	1425 - 5%	1500	65 309 DA 23 65 309 DA 123	67 387 D	-	-	7/16	5/8	1/64	.085
WD-9	1500 - 5% max.	1575	65 309 DA 26 65 309 DA 126	261 531 R91	-	-	7/16	5/8	1/32	.081
UD-9	1000 - 5% max.	1050	65 309 DA 27 65 309 DA 127	67 384 D	-	-	7/16	5/8	1/32	.100
UD-9	1200 -	1235 ± 5	65 309 DA 40 65 309 DA 140	261 379 R91	-	-	7/16	5/8	.000	.085
UD-9	1200 -	1235 ± 5	65 309 DA 42 65 309 DA 142	67 385 D	-	-	7/16	5/8	.000	.085
UD-9	1600 - 11%	1775 ± 30	65 309 DA 60 65 309 DA 160	254 839 R91	-	-	7/16	11/16	1/16	.090
UD-9	1175 - 5% max.	1185 ± 5	65 309 DA 61 65 309 DA 161	67 385 D	63	± 3	7/16	5/8	1/32	.096
UD-9	1250 - 11%	1385 ± 25	65 309 DA 62 65 309 DA 162	67 382 D	-	-	7/16	5/8	1/32	.093
UD-9	1400 - 11%	1555 ± 30	65 309 DA 64 65 309 DA 164	67 389 D	-	-	7/16	11/16	1/16	.090

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

9A Series Engines (Increased Horsepower)

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .030	7 High Idle Gap ± .005
UD-9A	1200 - 11%	1330 ± 25	65 309 DA 207	67 387 D	65	± 3	7/16	39/64	1/32	.090
UD-9A	1260 - 11%	1400 ± 25	65 309 DA 208	67 382 D	67	± 3	7/16	41/64	1/16	.100
UD-9A	1450 - 11%	1610 ± 30	65 309 DA 213	253 258 R91	65	± 3	7/16	5/8	3/64	.090
UD-9A	1800 - 11%	2000 ± 30	65 309 DA 215	69 855 D	70	± 3	7/16	5/8	1/32	.100
UD-9A	1500 - 11%	1665 ± 30	65 309 DA 219	67 383 D	55	± 3	7/16	41/64	1/32	.076
UD-9A	1200 - 5% max.	1260	65 309 DA 220	67 395 D	65	± 3	7/16	39/64	1/32	.090
UD-9A	1260 - 5% max.	1325	65 309 DA 221	252 961 R91	65	± 3	7/16	41/64	3/64	.100
UD-9A	1350 - 5% max.	1420	65 309 DA 222	261 103 R91	65	± 3	7/16	5/8	1/16	.080
UD-9A	1500 - 5% max.	1575	65 309 DA 226	67 382 D	65	± 3	7/16	41/64	5/64	.075
UD-9A	1800 - 11%	2000 ± 30	65 309 DA 230	69 855 D	70	± 3	7/16	5/8	1/32	.100
UD-9A	1200 - 11%	1330 ± 25	65 309 DA 231	67 387 D	70	± 3	7/16	5/8	3/64	.115
UD-9A	1500 -	1570 ± 30	65 309 DA 233	264 828 R91	70	± 3	7/16	41/64	3/64	.100
UD-9A	1320 - 11%	1465 ± 30	65 309 DA 234	261 052 R91	67	± 3	7/16	41/64	1/16	-
UD-9A	1175 -	1210 ± 10	65 309 DA 261	68 528 D	72	± 3	7/16	5/8	3/64	.115
UD-9A	1250 - 11%	1385 ± 25	65 309 DA 262	258 204 R91	65	± 3	7/16	39/64	1/32	.115

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

350 Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle Speed RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± .005
UD-350	1600 - 9%	1745 ± 30	268 304 R91	266 073 R91	69	± 3	7/16	41/64	1/32	.100
UD-350	1200 - 9%	1310 ± 25	268 307 R91	265 511 R91	69	± 3	7/16	39/64	3/64	.102
UD-350	1320 - 9%	1440 ± 30	268 308 R91	265 511 R91	69	± 3	7/16	5/8	1/32	.115
UD-350	1400 - 9%	1525 ± 30	268 309 R91	267 711 R91	69	± 3	7/16	5/8	1/64	.105
UD-350	1500 - 9%	1635 ± 30	268 310 R91	265 509 R91	69	± 3	7/16	19/32	0-.000	.107
UD-350	1500 - 9%	1635 ± 30	268 311 R91	266 073 R91	64	± 3	7/16	19/32	0-.000	.094
UD-350	1700 - 9%	1855 ± 30	268 312 R91	265 510 R91	69	± 3	7/16	5/8	1/32	.105
UD-350	1800 - 9%	1960 ± 30	268 315 R91	264 828 R91	69	± 3	7/16	39/64	1/32	.095
UD-350	1500 - 9%	1635 ± 30	268 319 R91	265 513 R91	56	± 3	7/16	41/64	1/64 - .015	.064
UD-350	1200 - 5% max.	1260 max.	268 330 R91	268 106 R91	64	± 3	7/16	5/8	1/32	.092
UD-350	1260 - 5% max.	1325 max.	268 331 R91	268 106 R91	64	± 3	7/16	5/8	1/32	.090
UD-350	1500 - 5%	1575 ± 30	268 333 R91	265 511 R91	69	± 3	7/16	19/32	0-.000	.104
UD-350	2000 - 5%	2100 ± 30	268 334 R91	264 828 R91	69	± 3	7/16	41/64	3/64	.100

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

ISS-1012-Y. 3-61.
PRINTED IN UNITED STATES OF AMERICA

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

14 Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± .005
UD-14	1150 - 11%	1250 ± 5	65 314 DA 2	67 381 D	80	± 4	3/8	39/64	3/32	.090
UD-14	1200 - 11%	1330 ± 25	65 314 DA 3	68 382 D	80	± 4	3/8	39/64	3/32	.090
UD-14	1250 - 11%	1385 ± 25	65 314 DA 4	67 382 D	80	± 4	3/8	39/64	3/32	.070
UD-14	1240 - 11%	1375 ± 25	65 314 DA 5	67 382 D	80	± 4	3/8	39/64	3/32	.070
UD-14	1350 - 11%	1500 ± 30	65 314 DA 6	67 389 D	80	± 4	3/8	5/8	1/64	.105
UD-14	1100 - 11%	1220 ± 25	65 314 DA 9	67 381 D	-	-	3/8	39/64	3/32	.090
UD-14	1200 - 5%	1260	65 314 DA 20	67 388 D	91	+ 4	3/8	5/8	1/64	.105
UD-14	1260 - 5% max.	1325	65 314 DA 21	67 395 D	-	-	3/8	39/64	3/32	.075
UD-14	1300 - 5% max.	1365	65 314 DA 22	67 381 D	-	-	3/8	39/64	3/32	.075
UD-14	1330 - 5% max.	1400	65 314 DA 23	67 381 D	-	-	3/8	5/8	1/64	.105
UD-14	915 - 5% max.	960	65 314 DA 25	67 390 D	-	-	5/8	1/2	.000 ± .000	.105
UD-14	1000 - 5% max.	1050	65 314 DA 26	67 384 D	-	-	3/8	39/64	1/16	.075
UD-14	1220 -	1300 max.	65 314 DA 44	67 385 D	-	-	3/8	39/64	3/32	.075

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

14A Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± .005
UD-14A	1250 - 11%	1385 ± 25	65 314 DA 104	67 382 D	91	± 4	3/8	5/8	.016 ± .020 -.016	.108
UD-14A	1240 - 11%	1375 ± 25	65 314 DA 105	67 362 D	82	± 4	3/8	5/8	.016 ± .020 -.016	.074
UD-14A	1100 - 11%	1220 ± 25	65 314 DA 109	67 381 D	91	± 4	3/8	39/64	1/32	.100
UD-14A	1225 - 5% max.	1285 max.	65 314 DA 110	263 029 R91	82	± 4	3/8	19/32	1/64	.115
UD-14A	1400 - 11%	1555 ± 30	65 314 DA 111	67 389 D	82	± 4	3/8	5/8	1/16	.075
UD-14A	1150 - 11%	1275 ± 25	65 314 DA 112	261 103 R91	91	± 4	3/8	39/64	1/32	.105
UD-14A	1200 - 11%	1330 ± 25	65 314 DA 113	67 387 D	91	± 4	3/8	39/64	3/64	.105
UD-14A	1170 - 11%	1300 ± 25	65 314 DA 114	67 389 D	82	± 4	3/8	39/64	3/64	.072
UD-14A	1170 - 11%	1300 ± 25	65 314 DA 116	264 767 R91	91	± 4	3/8	39/64	.012 ± .020 -.012	.115
UD-14A	900 - 11%	1000 ± 25	65 314 DA 117	67 885 D	91 **	± 4	7/16	39/64	.000	.145
UD-14A	1300 - 11%	1445 ± 30	65 314 DA 118	265 511 R91	91	± 4	3/8	39/64	3/64	.110
UD-14A	1800 - 9%	1960 ± 30	65 314 DA 119	265 510 R91	100	± 4	3/8	19/32	.000	.124
UD-14A	1200 - 5% max.	1260	65 314 DA 120	262 189 R91	91	± 4	3/8	39/64	3/64	.112
UD-14A	1350 - 9%	1470 ± 30	65 314 DA 121	265 510 R91	91	± 4	3/8	5/8	3/64	.105
UD-14A	1300 - 5% max.	1365	65 314 DA 122	67 381 D	91	± 4	3/8	39/64	1/16	.110
UD-14A	1200 - 5% max.	1260	65 314 DA 128	252 961 R91	82	± 4	3/8	5/8	1/32	.100
UD-14A	1600 - 0	1705 ± 25	65 314 DA 129	257 134 R91	100	± 4	7/16	21/32	1/16	.115
UD-14A	1150 - 5%	1205 ± 25	65-314 DA 130	262 820 R91	91	± 4	7/16	41/64	3/64	.127
UD-14A	1440 - 8%	1555 ± 30	65 314 DA 145	253 258 R91	82	± 4	3/8	5/8	1/32	.078

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

** Torque lever held manually against stop.

PRINTED IN UNITED STATES OF AMERICA

IH TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

16 Series Engines and 525 Series Engines

Model	Normal Gov. Engine RPM and Speed Percentage*	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± 005
UD-16	1800 - 11%	2000 ± 35	253 602 R91	257 122 R91	73	± 3	3/8	21/32	1/8	.075
UD-16	1800 - 11%	2000 ± 35	253 602 R92	257 720 R91	73	± 3	3/8	19/32	3/32	.070
UD-16	1450 - 11%	1610 ± 30	253 603 R91	257 105 R91	73	± 3	3/8	5/8	1/16	.100
UD-16	1450 - 11%	1610 ± 30	253 603 R92	257 719 R91	73	± 3	3/8	19/32	3/64	.075
UD-16	1400 - 11%	1555 ± 30	253 604 R92	257 123 R91	73	± 3	3/8	19/32	3/64	.080
UD-16	2200 - 11%	2345 ± 30	253 608 R92	262 896 R92	77	± 3	7/16	41/64	.006 ± .020 − .006	.060
UD-16	1250 - 11%	1385 ± 25	253 609 R92	257 063 R91	70	± 3	3/8	9/16	3/64 ± .015	.079
UD-16	1600 - 11%	1775 ± 30	253 610 R91	261 527 R91	69	± 3	3/8	39/64	1/16 ± .015	.079
UD-16	1800 - 5%	1890	253 642 R92	257 064 R91	73	± 3	3/8	19/32	3/32 ± .015	.079
UD-16	1330 - 5%	1395 ± 25	253 643 R91	267 221 R92	68	± 3	3/8	35/64	3/64	.085
UD-16	1500 - 5%	1575 ± 30	253 644 R91	269 407 R91	73	+ 3	3/8	19/32	3/64	.080
UD-525	1800 - 9%	1960 ± 30	268 506 R91	269 568 R91	65	± 3	7/16	5/8	3/64	.086
UD-525	1250 - 9%	1365 ± 25	268 507 R91	269 509 R91	60	± 3	7/16	5/8	3/64	.085
UD-525	1400 - 9%	1525 ± 30	268 508 R91	269 510 R91	70	± 3	7/16	5/8	3/64	.095
UD-525	1470 - 9%	1600 ± 30	268 509 R91	269 569 R91	70	± 3	7/16	5/8	3/64	.100
UD-525	1630 - 9%	1775 ± 30	268 510 R91	262 772 R92	70	± 3	7/16	5/8	3/64	.094
UD-525	1330 - 5%	1395 ± 25	268 530 R91	269 407 R91	60	± 3	7/16	5/8	3/64	.075

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

18A Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± .010
UD-18A	1100 - 11%	1220 ± 25	253 704 R92	257 106 R91	94	± 4	7/16	39/64	.000 + .015	.145
UD-18A	1160 - 11%	1290 ± 25	253 705 R92	257 107 R91	94	± 4	7/16	39/64	1/64	.120
UD-18A	1170 - 11%	1300 ± 25	253 706 R92	257 065 R91	94	± 4	7/16	39/64	.000 + .015	.145
UD-18A	1180 - 11%	1310 ± 25	253 707 R92	257 107 R91	94	± 4	7/16	39/64	.000 + .015	.140
UD-18A	1200 - 11%	1330 ± 25	253 708 R92	256 652 R91	94	± 4	7/16	39/64	1/32 + .015	.130
UD-18A	1225 - 11%	1360 ± 25	253 709 R92	257 065 R91	94	± 4	7/16	39/64	.000 + .015	.135
UD-18A	1250 - 11%	1385 ± 25	253 710 R92	257 065 R91	94	± 4	1/2	39/64	.000 + .015	.135
UD-18A	1360 - 11%	1510 ± 30	253 711 R92	257 105 R91	94	± 4	7/16	5/8	3/32	.115
UD-18A	1450 - 11%	1610 ± 30	253 712 R92	257 105 R91	94	± 4	7/16	39/64	.000 + .015	.145
UD-18A	1325 - 11%	1470 ± 30	253 714 R92	257 656 R91	94	± 4	7/16	39/64	.000 + .015	.135
UD-18A	1400 - 11%	1555 ± 30	253 715 R92	257 105 R91	94	± 4	7/16	5/8	3/64	.115
UD-18A	1360 - 11%	1510 ± 30	253 716 R92	261 097 R91	94	± 4	7/16	39/64	.000 + .015	.105
UD-18A	1000 - 11%	1110 ± 25	253 717 R91	262 168 R91	80**	± 4	1/2	3/8	.000 +.000	.123
UD-18A	1300 - 11%	1445 ± 30	253 719 R91	267 228 R92	94	± 4	7/16	5/8	1/16	.120
TD-18A	1350 - 11%	1500 ± 30	253 720 R91	257 063 R91	94	± 4	7/16	39/64	5/64	.105
TD-18 (182)	1450 - 9%	1580 ± 30	253 721 R91	273 849 R91	98	± 4	7/16	41/64	1/64	.090
UD-18A	1600 - 11%	1775 ± 30	253 722 R92	257 064 R91	85	± 4	7/16	19/32	1/32	.097
UD-18A	1200 - 5%max.	1260	253 741 R92	257 109 R91	94	± 4	1/2	39/64	.000 + .015	.125
UD-18A	1400 - 5% max.	1470	253 743 R91	257 065 R91	94	± 4	7/16	5/8	3/64	.115
UD-18A	1800 -	1930 ± 30	253 770 R91	262 772 R92	96	± 4	7/16	5/8	.005 ± .005	.150

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

** Torque arm held manually against stop.

PRINTED IN UNITED STATES OF AMERICA

IH TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

24 and 1091 Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage*	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap	7 High Idle Gap ± .010
TD-24	1300 - 11%	1445 ± 30	253 801 R92	256 652 R91	123	± 5	7/16	5/8	1/16 ± .015	.140
TD-24, UD-1091	1375 - 11%	1525 ± 30	253 802 R92	256 786 R91	122	± 5	7/16	5/8	5/64 ± .020	.140
UD-1091	1200 - 11%	1330 ± 25	253 803 R92	257 712 R91	114	± 5	7/16	5/8	1/16 ± .020	.125
UD-1091	900 - 11%	1000 ± 25	253 804 R92	257 456 R91	118	± 5	7/16	5/8	0	.140
UD-1091	1000 - 11%	1110 ± 25	253 806 R92	257 109 R91	120	± 5	7/16	39/64	1/16 ± .020	.137
UD-1091	1260 - 11%	1400 ± 30	253 807 R92	267 181 R91	123	± 5	7/16	39/64	5/64 ± .015	.125
UD-1091	1500 - 11%	1665 ± 30	253 808 R91	261 485 R91	120	± 5	7/16	19/32	3/64 ± .015	.110
UD-1091	1325 - 11%	1455 ± 30	253 809 R91	256 786 R91	123	± 5	7/16	39/64	3/32 ± .020	.138
UD-1091	1100 - 11%	1220 ± 25	253 810 R91	262 168 R91	122	± 5	7/16	37/64	1/64 ± .020	.130
UD-1091	1200 - 11%	1330 ± 25	253 811 R91	264 236 R91	122	± 5	7/16	19/32	1/16 ± .020	.140
UD-1091	1600 - 9%	1745 ± 30	253 812 R91	266 808 R91	112	± 5	7/16	5/8	.006 ± .020 - .006	.105
UD-1091	1200 - 11%	1330 ± 25	253 815 R91	264 764 R91	125	± 5	7/16	5/8	1/16 ± .020	.140
UD-1091	1400 - 11%	1555 ± 30	253 816 R91	269 569 R91	-	-	7/16	5/8	3/64 ± .020	.140
UD-1091	1190 - 5% max.	1250 max.	253 842 R91	257 106 R91	100	± 5	7/16	39/64	1/32 ± .020	.110
UD-1091	1260 - 5%	1325 ± 25	253 843 R91	272 149 R91	121	± 5	7/16	5/8	1/16 ± .020	.140
UD-1091	1375 - 5%	1445 ± 30	253 844 R91	262 168 R91	122	± 5	7/16	5/8	5/64 ± .020	.140
UD-1091	1100 700	1135 max. 850 max.	253 875 R92	257 125 R91	122	± 5	7/16	39/64	5/64 ± .015	.145

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH SINGLE PLUNGER "A" AND "B" FUEL INJECTION PUMPS
"35" and "40" Series Engines

Model	Normal Gov. Engine RPM and Speed Reg. Percentage	Governed Fast Idle Speed ± 25	Injection Pump Number "A"	Injection Pump Number "B"	Governor Spring Assembly	Ave. delivery in cc at 550 rpm for 550 rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS 1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .020	7 High Idle Gap ± .005
TD-40 PD-40 WD-40 ID-40	1200 - 11%	1330	258 596 R92	270 418 R91	257 134 R91	76	± 3	3/8	39/64	.047	.050
TD-40 WD-40	1100 - 11%	1220	258 597 R92	270 419 R91	67 382 D	69	± 3	3/8	39/64	.031	.060
TD-40 PD-40 WD-40 ID-40	1200 - 11%	1330	258 598 R92	270 420 R91	257 134 R91	76	± 3	7/16	5/8	.062	.095
TD-40 WD-40	1100 - 11%	1220	258 599 R92	270 421 R91	67 382 D	69	± 3	7/16	9/16	.031	.095
TD-35 10° and 45° heads	1100 - 11%	1220	258 600 R92	270 422 R91	67 389 D	66	± 3	3/8	39/64	.062	.050
PD-40	1250 - 11%	1390	258 601 R92	270 423 R91	257 134 R91	76	± 3	3/8	39/64	.047	.050
PD-40	1250 - 11%	1390	258 602 R92	270 424 R91	257 134 R91	76	± 3	7/16	5/8	.062	.095

IH TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS
GENERATOR APPLICATIONS

Model	Normal Gov. Engine RPM and Speed Reg. Percentage *	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per. variation of any nozzle from ave. delivery	FIELD SETTING DIMENSIONS High Idle Gap Operating position of control lever ± .005	Rated Load Gap At operating rated load and speed (past throttle) ± .005
UD-264	1200 1000	1240 ± 5 1035 ∓ 5	265 450 R91	252 962 R91	69	± 3	.150 .147	.055 .052
UD-264	1200 1000	1240 ± 5 1035 ∓ 5	265 451 R91	252 962 R91	69	± 3	.150 .147	.055 .052
UD-264	1200 1000	1230 ± 5 1020 ∓ 5	265 452 R91	267 652 R91	69	± 3	.173 .174	.063 .046
UD-264	1800 1500	1830 ± 10 1550 max.	265 453 R91	263 853 R91	69	± 3	.057 .033	.020 .011
UD-350	1200 1000	1240 ± 10 1040 max.	268 350 R91	69 807 D	69	± 3	.110 .120	.035 .026
UD-350	1200 1000	1240 ± 10 1040 max.	268 351 R91	69 807 D	69	± 3	.100 .110	.036 .031
UD-350	1200 1000	1240 ± 10 1040 max.	268 352 R91	69 807 D	69	± 3	.100 .110	.036 .031
UD-350	1800 1500	1840 ± 10 1550 max.	268 353 R91	255 408 R91	69	± 3	.104 .106	.029 .030
UD-525	1200 1000	1230 ± 10 1020 ∓ 10	268 550 R91	257 125 R91	-	-	.085 .087	.031 .034
UD-525	1800 1500	1845 ± 10 1545 max.	268 551 R91	269 998 R91	61	± 3	.105 .105	.035 .025

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

ISS-1012-Y. 3-61.
PRINTED IN UNITED STATES OF AMERICA

IH SINGLE PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

GENERATOR APPLICATIONS

Model	Normal Gov. Engine RPM and Speed Reg. Percentage *	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per. variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .030	7 High Idle Gap ± .005
UD-6	1200 1000	1270 ± 5 1060 max.	65 306 DA 42 65 306 DA 142	69 739 D	53	± 3	-	-	-	.100
UD-6	1200 1000	1270 ± 5 1060 max.	65 306 DA 45 65 306 DA 145	69 739 D	53	± 3	-	-	-	.100
UD-6A	1200 1000	1270 ± 5 1060 max.	65 306 DA 242	69 739 D	61	± 3	-	-	-	.116
UD-6A	1200 1000	1270 ± 5 1060 max.	65 306 DA 245	69 739 D	61	± 3	-	-	-	.116
UD-6A	1500 1200	1575 max. 1260 max.	65 306 DA 246	262 167 R91	62	± 3	-	-	-	.099 .104
UD-6A	1400	1470 max.	65 306 DA 248	263 029 R91	61	± 3	-	-	-	.119
UD-6A	1800 **	1850 max.	65 306 DA 249	263 853 R91	61	± 3	-	-	-	-
UD-6A	1200 ** 1000	1270 ± 5 1060 max.	65 306 DA 251	261 348 R91	61	± 3	-	-	-	.130
UD-9	1200 1200 - 5% max.	1270 ± 5 1260 max.	65 309 DA 43 65 309 DA 143	-	-	-	-	-	-	.115
UD-9	1200 1000	1260 ± 5 1050 max.	65 309 DA 49 65 309 DA 149	261 100 R91	-	-	-	-	-	.096
UD-9	1200 1000	1260 ± 5 1050 max.	65 309 DA 50 65 309 DA 150	261 100 R91	-	-	-	-	-	.096
UD-9	1050	1165 ± 25	65 309 DA 232	67 885 D	70	± 3	-	-	-	.150
UD-9A	1200 1000	1260 ± 5 1050 max.	65 309 DA 249	261 348 R91	70	± 3	-	-	-	.115
UD-9A	1060	1120 ± 5	65 309 DA 251	67 391 D	58	± 3	-	-	-	.125
UD-9A	1200 1000	1260 ± 5 1050 max.	65 309 DA 250	261 348 R91	70	± 3	-	-	-	.115

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

** See Note 6

IH SINGLE AND TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

GENERATOR APPLICATIONS

Model	Normal Gov. Engine RPM and Speed Reg. Percentage *	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ± .030	7 High Idle Gap ± .005
UD-9A	1500 1200	1575 max. 1260 max.	65 309 DA 265	262 167 R91	72	± 3	-	-	-	.104 .107
UD-9A	1175	1210 ± 10	65 309 DA 266	67 385 D	-	-	-	-	-	-
UD-9A	1500	1545 + 0 -20	65 309 DA 267	252 962 R91	70	± 3	-	-	-	-
UD-9A	1800 1500	1825 ± 10 1550 max.	65 309 DA 268	68 528 D	70	± 3	-	-	-	.054 .054
UD-14	1200	1230 ± 5	65 314 DA 40	67 385 D	-	-	-	-	-	.070
UD-14	1200	1230 ± 5	65 314 DA 42	67 385 D	-	-	-	-	-	.070
UD-14	1200 1000	1240 ± 5 1050 max.	65 314 DA 43	67 385 D	-	-	-	-	-	.070
UD-14A	1200 1000	1240 ± 5 1035 ∓ 5	65 314 DA 140	69 807 D	91	± 4	-	-	-	.106 .095
UD-14A	1200 1000	1240 ± 5 1035 ∓ 5	65 314 DA 142	69 807 D	91	± 4	-	-	-	.106 .095
UD-14A	1225	1280 ± 10	65 314 DA 146	255 048 R91	91	± 4	-	-	-	-
UD-14A	1200 1000	1225 ± 5 1020 ∓ 5	65 314 DA 147	69 807 D	91	± 4	-	-	-	.090
UD-14A	1500 1200	1520 ± 10 1240 max.	65 314 DA 148	268 028 R91	-	-	-	-	-	.099 .093
Dual speed	1800 **	1840 ± 5	253 671 R91	264 764 R91	73	± 4	-	-	-	-
UD-16	1500 **	1530 ± 5					-	-	-	-
Single speed	1500 **	1530 ± 5					-	-	-	-
UD-16	1800 **	1825 ± 5	253 672 R91	264 821 R91	73	± 4	-	-	-	.110 .115

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

** See Note 6

IH TWIN PLUNGER "A" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

GENERATOR APPLICATIONS

Model	Normal Gov. Engine RPM and Speed Reg. Percentage *	Governed High Idle RPM	Complete Injection Pump Number	Complete Governor Spring Number	Ave. Delivery in cc at 550 rpm for 550 Rev.	Max. per. variation of any nozzle from ave. delivery	TORQUE CONTROL ADJUSTMENTS			
							1 Torque Lever Stop Screw	2 Torque Spring Shoe Screw	3 Over Load Gap ±	7 High Idle Gap ± .010
UD-16	1200 1000	1260 max. 1050 max.	253 673 R92	257 125 R91	72	± 3	-	-	-	.095 .100
UD-16	1200 1000	1260 max. 1050 max.	253 674 R92	257 125 R91	72	± 3	-	-	-	.095 .100
UD-16	1800	1890 max.	253 675 R91	262 858 R91	59	± 3	-	-	-	.068
UD-18A	900 - 11%	1575	253 718 R91	265 335 R91	110	± 5	-	-	-	.130
UD-18A	1500 - 5% max.	1000	253 742 R92	261 338 R91	91	± 4	-	-	-	.115
UD-18A	1800 1500	1845 + 10 1545 max.	253 768 R91	271 611 R91	-	-	-	-	-	.105 .108
UD-18A	1500 -	1540 ± 10 -	253 769 R91	264 208 R91	-	-	-	-	-	- .112
UD-18A	1250	1285 ± 5	253 772 R92	257 110 R91	94	± 4	-	-	-	.120
UD-18A	1200 1000	1260 max. 1050 max.	253 773 R92	257 456 R91	94	± 4	-	-	-	.150 .155
UD-18A	1200 1000	1260 max. 1050 max.	253 774 R92	257 456 R91	94	± 4	-	-	-	.150 .155
UD-18A	1200 1000	1235 + 5 1030 max.	253 775 R92	257 456 R91	94	± 4	-	-	-	.135
UD-18A	1500 1200	1575 max. 1260 max.	253 776 R91	262 169 R91	94	± 4	-	-	-	.138 .149
UD-1091	1400	1435 ± 10	253 867 R91	257 109 R91	122	± 5	-	-	-	.130
UD-1091	1375	1415 max.	253 868 R91	271 444 R91	122	± 5	-	-	-	.140
UD-1091	1500	1540 ± 10	253 869 R91	262 168 R91	122	± 5	-	-	-	-
UD-1091	1450	1485 ± 10	253 870 R91	262 168 R91	122	± 5	-	-	-	.125
UD-1091	1200	1230 ± 5	253 871 R91	257 110 R91	122	± 5	-	-	-	.110
UD-1091	1375	1445 max.	253 872 R91	257 106 R91	122	± 5	-	-	-	.133
UD-1091	1200 1000	1260 max. 1060 max.	253 873 R92	257 125 R91	122	± 5	-	-	-	.130 .135
UD-1091	1200 ** 1200 1000	1230 ± 5 1260 max. 1060 max.	253 874 R92	257 125 R91	122	± 5	-	-	-	- .130 .135

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

** See Note 6

IH SINGLE PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

264 and 281 Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from aver. delivery	Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Over-load gap	7 High idle gap ± .005: Orifice	7 High idle gap ± .005: Open
UD-264	1600-9%	270 001 R91	271 610 R91	69	53	±3	7/16	5/8 ± 1/32	1/32 ± 1/64	.071	.071
UD-264	1500-9%	270 002 R91	266 073 R91 271 610 R91	58	47	±3	7/16	39/64	3/64	.062	.062
UD-264	1200-9%	270 003 R91	265 511 R91 267 711 R91	58	47	±3	7/16	39/64	1/32	.069	.069
UD-264	1400-9%	270 004 R91	267 711 R91 265 513 R91	60	47	±3	7/16	39/64	1/32	.064	.064
UD-264	1470-9%	270 005 R91	267 711 R91 265 513 R91	65	50	±3	7/16	5/8	1/32	.075	.075
UD-264	1350-9%	270 006 R91	265 510 R91 265 509 R91	69	53	±3	7/16	5/8	3/64	.076	.076
UD-264	1100-9%	270 007 R91	264 767 R91	58	47	±3	7/16	19/32	1/32	.078	.078
UD-264	1200-9%	270 008 R91	267 711 R91 266 073 R91	54	39	±3	7/16	39/64	1/32	.045	.045
UD-264	1400-9%	270 009 R91	265 535 R91	54	39	±3	7/16	39/64	1/32	.047	.047
UD-264	1600-9%	270 010 R91	266 073 R91	54	39	±3	7/16	39/64 ± 1/32	1/32 ± 1/64	.035	.035
UD-264	1250-9%	270 011 R91	267 711 R91	58	47	±3	7/16	19/32 ± 1/32	1/32 ± 1/64	.059	.059
UD-264	1200-5% max.	270 012 R91	272 596 R91	58	47	±3	7/16	39/64	1/32	.072	.072
UD-264	1300-5% max.	270 014 R91	268 106 R91	69	53	±3	7/16	5/8 ± 1/32	1/32 ± 1/64	.083	.083
UD-264	1400-5% max.	270 015 R91	267 711 R91	69	53	±3	7/16	39/64 ± 1/32	1/32 ± 1/64	.058	.058
UD-264	1800-9%	270 020 R91	274 462 R91 276 466 R91	58	47	±3	7/16	5/8	1/32	.070	.070
UD-264	2000	270 027 R91	276 465 R91				7/16	5/8 ± 1/32	3/64 ± 1/64	.072	.072
UD-281	1500-9%	270 029 R91	265 513 R91	69	53	±3	7/16	5/8 ± 1/32	3/64 ± 1/64	.075	.075
UD-281	1060-9%	270 031 R91	272 596 R91		54**	±3	7/16	19/32	1/32	.085	.085

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding

** Torque arm held manually against stop.

IH SINGLE PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

350 and 370 Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from aver delivery	Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Over-load gap	7 High idle gap ± .005: Orifice	7 High idle gap ± .005: Open
UD-350	1600-9%	270 051 R91	266 073 R91	69	65	±3	7/16	41/64	1/32	.100	.100
UD-350	1200-9%	270 053 R91	264 767 R91	69	65	±3	7/16	39/64	3/64	.102	.102
UD-350	1320-9%	270 054 R91	265 511 R91	69	65	±3	7/16	5/8	1/32	.115	.115
UD-350	1400-9%	270 055 R91	267 711 R91	69	65	±3	7/16	5/8	1/32	.105	.105
UD-350	1500-9%	270 056 R91	265 509 R91	69	65	±3	7/16	19/32	1/64 ± 1/64	.107	.107
UD-350	1500-9%	270 057 R91	266 073 R91	64	61	±3	7/16	19/32	.000 ± 1/64	.094	.094
UD-350	1500-9%	270 060 R91	265 513 R91 271 610 R91	56	51	±3	7/16	41/64	1/64	.064	.064
UD-350	1200-5% max.	270 061 R91	268 106 R91	64	61	±3	7/16	5/8	1/32	.092	.092
UD-350	1700-9%	270 058 R91	265 510 R91	69	65	±3	7/16	5/8	1/64	.105	.105
UD-350	1260-5% max.	270 062 R91	268 106 R91	64	61	±3	7/16	5/8	1/32	.090	.090
UD-350	1500-5%	270 063 R91	265 511 R91	69	65	±3	7/16	19/32	.000 ±1/64	.104	.104
UD-350	2000-5%	270 068 R91	274 495 R91 276 468 R91	69	65	±3	7/16 7/16	41/64	3/64	.100	.100
UD-350	2100-5%	270 069 R91	276 467 R91	71	67	±3	7/16	41/64 ± 1/32	3/64 ± 1/64	.090	.090
UD-350	1385-5%	270 070 R91	265 511 R91	61	58	±3	7/16	41/64	1/32	.090	.090
UD-350	1440-5%	270 071 R91	265 511 R91	69	65	±3	7/16	41/64	1/32	.090	.090
UD-350	1665-5%	270 072 R91	274 938 R91	69	65	±3	7/16	39/46	1/64	.100	.100
UD-350	1260-9%	270 073 R91	265 511 R91	69	65	±3	7/16	5/8	1/32	.105	.105
UD-350	1450-9%	270 077 R91	267 711 R91	67	64	±3	7/16	5/8	3/64		
UD-350	1700-5% max.	270 078 R91	275 680 R91	58	55	±3	7/16	5/8	1/32		
UD-350	1500-5%	270 079 R91	264 828 R91	64	61	±3	7/16	5/8	1/64		
UD-370	1500-5%	270 083 R91	265 510 R91		71	±3	7/16	5/8	1/64		
UD-370	1760-5%	270 084 R91	275 680 R91		64	±3	7/16	41/64	.000 +.020		.104

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH SINGLE PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

14A Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from aver delivery	Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Overload gap	7 High idle gap ± .005: Orifice	7 High idle gap ± .005: Open
UD-14A	1400-9%	270 100 R91	264 828 R91 266 073 R91	91	80	±4	3/8	39/64	1/16	.095	.079
UD-14A	1250-9%	270 103 R91	265 509 R91	91	80	±4	3/8	39/64 ± 1/32	1/64 ± 1/64		.087
UD-14A	1240-9%	270 104 R91	266 073 R91	82	71	±3	3/8	39/64 ± 1/32	1/64 ± 1/64		.072
UD-14A	1100-9%	270 105 R91	268 106 R91 264 767 R91	91	80	±4	3/8	39/64	1/32	.090	.097
UD-14A	1150-9%	270 106 R91	265 511 R91	91	80	±4	3/8	39/64 ± 1/32	1/32 ± 1/64		.095
UD-14A	1200-9%	270 107 R91	264 767 R91 264 828 R91	91	80	±4	3/8	39/64	3/64	.095	.089
UD-14A	1170-9%	270 108 R91	265 511 R91 266 073 R91	82	71	±4	3/8	39/64	3/64	.062	.070
UD-14A	1170-9%	270 109 R91	269 098 R91 265 510 R91	91	80	±4	3/8	39/64	1/64	.105	.094
UD-14A	1300-9%	270 111 R91	266 073 R91	91	80	±4	3/8	39/64 ± 1/32	3/64 ± 1/64		.084
UD-14A	1200-5% max.	270 112 R91	272 596 R91	91	80	±4	3/8	39/64 ± 1/32	3/64 ± 1/64		.092
UD-14A	1300-5% max.	270 113 R91	269 098 R91	91	80	±4	3/8	39/64 ± 1/32	1/16 ± 1/64		.087
UD-14A	1200-5% max.	270 114 R91	272 596 R91	82	71	±3	3/8	39/64 ± 1/32	1/32 ± 1/64		.083
UD-14A	1600-9%	270 115 R91	265 509 R91 265 513 R91	100	90	±4	7/16	21/32	1/32	.105	.091
UD-14A	1440	270 118 R91	266 073 R91		71	±3	3/8	39/64 ± 1/32	1/32 ± 1/64		.061
UD-14A	1225	270 119 R91	69 739 D ‡	91	80	±4	----	----	----		
UD-14A, UD-461	1800-9%	270 122 R91	264 828 R91 274 462 R91	91	85	±4	3/8	19/32	.020 ±1/64	.097	.062
UD-14A	1150-5%	270 123 R91	262 820 R91 272 596 R91	91	80	±4	7/16	41/64	3/64	.117	.066
UD-14A	1350-9%	270 127 R91	265 510 R91 266 073 R91	91	80	±4	3/8	5/8	3/64	.095	.078
UD-14A	900-9%	270 110 R91	272 597 R91	91	80**	±4	7/16	39/64	.000	.094	.094
UD-14A	1400-9%	270 102 R91	265 513 R91	91	80	±4	3/8	39/64	1/16	.079	.079
UD-14A	1500-9%	270 129 R91	265 513 R91		90	±4	3/8	5/8	1/32		.077
UD-14A	1600-9%	270 130 R91	276 465 R91		92	±4	3/8	5/8	1/64		.075
UD-14A	1395-5%	270 133 R91	276 465 R91	91	84	±4	3/8	39/64 ± 1/32	1/32 ± 1/64		.075
UD-14A	1350-9%	270 134 R91	266 073 R91		85	±4	3/8	39/64	3/64		.085
UD-14A	1400-5%	270 135 R91	274 495 R91		80	±4	3/8	39/64	3/64		.078

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

‡ Attach spring to upper hole in governor fork shaft lever for higher normal governed rpm, and to lower hole for lower normal governed rpm.

** Torque arm held manually against stop.

PRINTED IN UNITED STATES OF AMERICA

IH TWIN PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

525 and 554 Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Orifice	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine: Open	Maximum permissible variation of any nozzle from aver. delivery	Torque Control Adjustments: 1 Torque lever stop screw	2 Torque spring shoe screw	3 Overload gap	7 High idle gap ± .005: Orifice	7 High idle gap ± .005: Open
UD-525	1800-9%	270 150 R91	272 595 R91	77	77	±3	7/16	5/8 ±1/32	3/64 ±1/64	.115	.115
UD-525	1800-9%	270 151 R91	269 568 R91	65	65	±3	7/16	5/8 ±1/32	3/64 ±/164	.086	.086
UD-525	1250-9%	270 152 R91	269 509 R91	60	60	±3	7/16	5/8 ±1/32	3/64 ±1/64	.085	.085
UD-525	1400-9%	270 153 R91	269 510 R91	70	70	±3	7/16	5/8 ±1/32	3/64 ±1/64	.095	.095
UD-525	1470-9%	270 154 R91	269 569 R91	70	70	±3	7/16	5/8 ±1/32	3/64 ±1/64	.100	.100
UD-525	1630-9%	270 155 R91	262 772 R91	70	70	±3	7/16	5/8 ±1/32	3/64 ±1/64	.095	.094
UD-525	1330-5%	270 156 R91	269 407 R91	60	60	±3	7/16	5/8 ±1/32	3/64 ±1/64	.075	.075
UD-525	2000-9%	270 159 R91	273 893 R91	62	62	±3	7/16	41/64 ±1/32	1/32 ±1/64	.080	.080
UD-525	1500-9%	270 160 R91	273 849 R91	77	77	±3	7/16	5/8 ±1/32	1/16 ±1/64	.100	.100
UD-525	2300-5%	270 161 R91	269 295 R91	74	74	±3	7/16	39/64	1/64	.072	.072
UD-525	1600-9%	270 162 R91	269 295 R91	77	77	±3	7/16	5/8	3/64	.100	.100
UD-525	1300-5%	270 163 R91	274 776 R91	67	67	±3	7/16	5/8 ±1/32	3/64 ±1/64	.075	.075
UD-525	1395-5%	270 164 R91	275 056 R91	60	60	±3	7/16	5/8 ±1/32	3/64 ±1/64	.075	.075
UD-525	1220-9%	270 165 R91	267 221 R91	70	70	±3	7/16	5/8 ±1/32	3/64 ±1/64	.115	.115
UD-525	1590-5%	270 166 R91	277 906 R91	77	77	±3	7/16	5/8 ±1/32	3/64 ±1/64	.110	.110
UD-554	1870	270 171 R91	277 023 R91		82	±4	7/16	5/8 ±1/32	1/32 ±1/64		.119

*Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH TWIN PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

18A Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions		Maximum permissible variation of any nozzle from aver. delivery	Torque Control Adjustments				
				Type of nozzle in engine			1 Torque lever stop screw	2 Torque spring shoe screw	3 Over-load gap	7 High idle gap ± .005	
				Orifice	Open					Orifice	Open
UD-18A	1600-11%	270 201 R91	257 064 R91	94	89	±4	7/16	37/64	1/16	.105	.105
UD-18A	1100-11%	270 203 R91	257 106 R91	94	89	±4	7/16	37/64	.000 +1/64	.145	.145
UD-18A	1160-11%	270 204 R91	257 107 R91	94	89	±4	7/16	37/64	1/64 ± 1/64	.120	.120
UD-18A	1170-11%	270 205 R91	257 065 R91	94	89	±4	7/16	37/64	.000 +1/64	.145	.145
UD-18A	1180-11%	270 206 R91	257 107 R91	94	89	±4	7/16	37/64	.000 + 1/64	.140	.140
UD-18A	1200-11%	270 207 R91	273 849 R91	94	89	±4	7/16	37/64	1/32	.130	.130
UD-18A	1225-11%	270 208 R91	257 065 R91	94	89	±4	7/16	37/64	.000 +1/64	.135	.135
UD-18A	1250-11%	270 209 R91	257 065 R91	94	89	±4	1/2	37/64	.000 +1/64	.135	.135
UD-18A	1450-11%	270 211 R91	257 105 R91	94	89	±4	7/16	37/64 ± 1/32	.000 +1/64	.145	.145
UD-18A	1325-11%	270 212 R91	257 656 R91	94	89	±4	7/16	37/64	.000 +1/64	.135	.135
UD-18A	1360-11%	270 214 R91	261 097 R91	94	89	±4	7/16	37/64	.000 +1/64	.105	.105
UD-18A	1000-11%	270 215 R91	262 168 R91	91	80 §	±4	1/2	11/32	.000	.123	.123
UD-18A	900-11%	270 216 R91	265 335 R91	114	110 §	±5	----	----	---- -	.130	.130

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

§ Torque arm held manually against stop.

ISS-1012-Y. 3-61.

PRINTED IN UNITED STATES OF AMERICA

IH TWIN PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

18A Series Engines

Model	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions — Type of nozzle in engine		Maximum permissible variation of any nozzle from aver. delivery	Torque Control Adjustments				
							1 Torque lever stop screw	2 Torque spring shoe screw	3 Over-load gap	7 High idle gap ± .005	
				Orifice	Open					Orifice	Open
UD-18A	1300-11%	270 217 R91	267 228 R92	94	89	±4	7/16	19/32	1/16	.120	.120
UD-18A	1200-5% max.	270 219 R91	257 109 R91	94	89	±4	1/2	37/64	.000 ± 1/64	.125	.125
UD-18A	1400-5% max.	270 221 R91	257 065 R91	94	89	±4	7/16	19/32 ± 1/32	3/64 ± 1/64	.115	.115
UD-18A	1800	270 223 R91	262 772 R92	96	91	±4	7/16	19/32	.005 ± 1/64	.150	.150
UD-18A	1250	270 224 R91	257 110 R91	94	89	±4	----	----	----	.120	.120
UD-18A	1500-9%	270 233 R91	277 023 R91				7/16	5/8 ± 1/32	1/16 ± 1/64	.115	.115
UD-18A	1600-5%	270 234 R91	273 803 R91		72	±3	7/16	39/64 ± 1/32	.010 ± .010	.054	.054
UD-18A	1000-5%	270 235 R91	257 125 R91	94	89	±4	7/16	37/64 ± 1/32	1/32 ± 1/64	.092	.092
UD-18A	1800-9%	270 238 R91	312 192 R91		82	±4	7/16	5/8	1/32		
UD-18A	1500-9%	270 240 R91	273 803 R91	94	89	±4	7/16	37/64	1/16	.080	.080
UD-18A	1360-9%	270 242 R91	269 295 R91		88	±4	7/16	37/64	5/64	.095	.095
UD-18A, UD-691	1360-11%	270 210 R91	273 803 R91	94	89	±4	7/16	19/32	3/32	.115	.115
UD-18A, UD-691	1400-11%	270 213 R91	257 105 R91	94	89	±4	7/16	19/32	3/64	.115	.115
UD-18A, UD-691	1600-11%	270 218 R91	257 064 R91		82	±4	7/16	9/16	1/32		.097
UD-18A, UD-691	1350-11%	270 229 R91	257 063 R91	94	89	±4	7/16	37/64	5/64	.105	.105

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

IH TWIN PLUNGER "B" INJECTION PUMPS USED ON MANUFACTURER CUSTOMERS' UNITS

1091 Series Engines

MODEL	Normal governed engine rpm and speed regulation percentage *	Complete injection pump number	Complete governor spring number	Av. del. in cc at 550 rpm for 550 revolutions		Maximum permissible variation of any nozzle from average delivery	Torque Control Adjustments				
				Type of nozzle in engine			1	2	3	7	
				Orifice	Open		Torque lever stop screw	Torque spring shoe screw	Overload gap	High idle gap ± .005	
										Orifice	Open
UD-1091	1300-11%	270 250 R91	256 652 R91		113	± 5	7/16	19/32	1/16		.150
UD-1091	1375-11%	270 251 R91	256 786 R91		112	± 5	7/16	19/32	5/64		.148
UD-1091	1200-11%	270 252 R91	257 712 R91	114	110	± 5	7/16	19/32	1/16	.125	.156
UD-1091	900-11%	270 253 R91	257 456 R91	114	110	± 5	7/16	19/32	None		.190
UD-1091	1000-11%	270 254 R91	257 109 R91		104	± 5	7/16	37/64	3/64		.159
UD-1091	1260-11%	270 255 R91	267 181 R91	123	113	± 5	7/16	37/64	5/64	.125	.156
UD-1091	1500-11%	270 256 R91	261 485 R91		106	± 5	7/16	9/16	3/64		.139
UD-1091	1325-11%	270 257 R91	256 786 R91		113	± 5	7/16	37/64	3/32		.151
UD-1091	1100-11%	270 258 R91	262 168 R91		105	± 5	7/16	35/64	1/64		.156
UD-1091	1200-11%	270 259 R91	264 236 R91	125	112	± 5	7/16	9/16	1/16	.140	.164
UD-1091	1600-9%	270 260 R91	266 808 R91		100	± 5	7/16	19/32	.006		.111
UD-1091	1400-9%	270 262 R91	267 228 R91	128	117	± 5	7/16	19/32	3/64	.140	.157
UD-1091	1190-5% max	270 263 R91	257 106 R91	100	95	± 5	7/16	37/64	1/32	.110	.117
UD-1091	1260-5%	270 264 R91	272 149 R91		111	± 5	7/16	19/32	1/16		.156
UD-1091	1375-5%	270 265 R91	262 168 R91		112	± 5	7/16	19/32	5/64		.151
UD-1091	1100	270 272 R91	257 125 R91	122	112	± 5	7/16	37/64	5/64	.145	.175
UD-1091	1200-11%	270 275 R91	261 338 R91		118	± 5	7/16	19/32	1/32		.170
UD-1091	1400-11%	270 276 R91	269 569 R91				7/16	19/32	3/64		.140
UD-1091	1400-5%	270 280 R91	274 776 R91		117	± 5	7/16	5/8	3/64		.162
UD-1091	1200-5%	270 282 R91	274 776 R91		112	± 5	7/16	19/32	1/16		.164
UDT-1091	1000-9%	270 284 R91	257 125 R91				7/16	19/32	None		.165
UDT-1091	1500-9%	270 286 R91	273 849 R91		167	± 5	7/16	19/32	1/64		.137
UDT-1091	1375	270 288 R91	267 221 R91		166	± 5	7/16	5/8	1/64		.126
UDT-1091	1200	270 289 R91	264 764 R91		150	± 5	7/16	19/32	1/64		.131
UDT-1091	1200-7%	270 291 R91	264 764 R91				7/16	5/8	3/64		.146

* Governed high idle speed rpm can be determined by multiplying the normal governed engine rpm by the speed regulation percentage and adding the answer to the normal governed engine rpm.

PRINTED IN UNITED STATES OF AMERICA

IH SINGLE PLUNGER "B" INJECTION PUMP SPEED CHART
GENERATOR APPLICATIONS

Power unit model	Injection pump complete	Governor springs		Av. del. in cc at 550 for 550 revolutions — Type of nozzle in engine		Maximum perm. var. of any nozzle from avg. delivery	Field Setting Dimensions — High Idle Gap — Operation position of control lever ± .005	Field Setting Dimensions — Rated Load Gap — At operating rated load and speed (part throttle) ± .005	Governed engine rpm	Gov. fast idle rpm
		Outer	Assembly	Orifice	Open					
UD-264	270 016 R91	67 838 D	252 962 R91 *	69	53	± 3	(1200) .150 (1000) .147	.055 .052	1200 1000	1240 1035
UD-264	270 017 R91	67 838 D	252 962 R91 *	69	53	± 3	(1200) .150 (1000) .147	.055 .052	1200 1000	1240 1035
UD-264	270 018 R91	66 427 D	267 652 R91 *	69	53	± 3	(1200) .173 (1000) .174	.063 .046	1200 1000	1230 1020
UD-264	270 019 R91	263 854 R1	263 853 R91 *	69	53	± 3	(1800) .057 (1500) .033	.020 .011	1800 1500	1830 1550
UD-264	270 022 R91	67 838 D	252 962 R91 *	69	53	± 3	(1200) .150 (1000) .147	.055 .052	1200 1000	1225 1015
UD-350	270 064 R91	69 806 D	69 807 D*	69	65	± 3	(1200) .110 (1000) .120	.035 .026	1200 1000	1240 1040
UD-350	270 065 R91	69 806 D	69 807 D*	69	65	± 3	(1200) .100 (1000) .110	.036 .031	1200 1000	1240 1040
UD-350	270 066 R91	69 806 D	69 807 D*	69	65	± 3	(1200) .100 (1000) .110	.036 .031	1200 1000	1240 1040
UD-350	270 067 R91	67 231 D	255 408 R91 *	69	65	± 3	(1800) .104 (1500) .106	.029 .030	1800 1500	1840 1550
UD-461	270 116 R91	69 806 D **	69 807 D*	--	80	± 4	(1200) .115 (1000) .110	.028 .035	1200 1000	1235 1025
UD-461	270 117 R91	69 806 D **	69 807 D*	--	80	± 4	(1200) .115 (1000) .110	.028 .035	1200 1000	1235 1025
UD-461	270 120 R91	69 806 D **	69 807 D*	--	80	± 4	(1200) .109 (1000) .113	.043 .045	1200 1000	1225 1020
UD-461	270 121 R91	263 854 R1 **	268 028 R91 *	--	80	± 4	(1500) .110 (1200) .109	.034 .033	1500 1200	1520 1240
UD-461	270 132 R91	263 854 R1	263 853 R91 *	--	92	± 4	(1800) .098 (1500) .096	.030 .036	1800 1500	1855 1540

* Attach spring assembly to upper hole in governor fork shaft lever for high normal governed rpm and to lower hole for lower normal governed rpm.

** If governed fast idle is not within specified limits with no bumper spring contact, modify governor spring to obtain correct speed. NOTE: if bumper spring contact is necessary to prevent surging after correct spring has been worked out, fast idle speed must still be within specifications.

IH TWIN PLUNGER "B" INJECTION PUMP SPEED CHART
GENERATOR APPLICATIONS

Power unit model	Injection pump complete	Governor springs		Av. del. in cc at 550 rpm for 550 revolutions		Maximum perm. var. of any nozzle from avg. delivery	Field Setting Dimensions		Governed engine rpm	Gov. fast idle rpm
				Type of nozzle in engine			High Idle Gap	Rated Load Gap		
		Outer	Assembly	Orifice	Open		Operation position of control lever ± .005	At operating rated load and speed (part throttle) ± .005		
UD-525, UD-554	270 157 R91	257 127 R1	257 125 R91 *				(1200) .085 (1000) .087	.031 .034	1200 1000	1230 1020
UD-525, UD-554	270 158 R91	68 527 D	269 998 R91 *		61	± 3	(1800) .105 (1500) .105	.035 .025	1800 1500	1845 1545
UD-18A, UD-691	270 220 R91	67 838 D	261 338 R91 ***	94	89	± 4	(1500) .115	.050	1500	1575 max
UD-18A, UD-691	270 222 R91	66 427 D	264 208 R91	94	89	± 4	(1500) .112	.031	1500	1540 ±10
UD-18A, UD-691	270 225 R91	67 884 D	257 456 R91 *	94	89	± 4	(1200) .150 (1000) .155	.020 .020	1200 1000	1240 1040
UD-18A, UD-691	270 226 R91	67 884 D	257 456 R91 *	94	89	± 4	(1200) .150 (1000) .155	.020 .020	1200 1000	1240 1040
UD-18A, UD-691	270 227 R91	67 884 D	257 456 R91 *	94	89	± 4	(1200) .135 (1000) .135	.043 .043	1200 1000	1235 1030
UD-18A, UD-691	270 228 R91	67 263 D	262 169 R91 *	94	89	± 4	(1500) .138 (1200) .149	.033 .028	1500 1200	1530 1255
UD-691	270 230 R91	69 740 D	271 611 R91 *		89	± 4	(1800) .105 (1500) .108	.032 .038	1800 1500	1845 1545
UD-1091	270 266 R91	66 427 D ****	262 168 R91 ***		117	± 5	.133	.031	1500	1540
UD-1091	270 267 R91	66 427 D	262 168 R91 ***		117	± 5	.125	.047	1450	1485
UD-1091	270 268 R91	67 884 D	257 110 R91 ***		117	± 5	.110	.015	1200	1230
UD-1091	270 269 R91	67 263 D	257 106 R91 ***		117	± 5	.133	.032	1375	1445
UD-1091	270 270 R91	257 127 R1	257 125 R91 *		117	± 5	(1200) .130 (1000) .135	.035 .040	1200 1000	1240 1040
UD-1091	270 271 R91	257 127 R1	257 125 R91 *		117	± 5	(1200) .130 (1000) .135	.035 .040	1200 1000	1240 1040
UD-1091	270 273 R91	257 127 R1	257 125 R91 ***		117	± 5	.120	.050	1200	1230
UD-1091	270 274 R91	257 655 R1	271 444 R91 ***		117	± 5	.140	.040	1375	1415
UD-1091	270 278 R91	67 884 D	257 110 R91 ***		117	± 5	.120	.035	1200	1230
UD-1091	270 279 R91	67 223 D	257 109 R91 ***		117	± 5	.130	.040	1400	1435

* Attach spring assembly to upper hole in governor fork shaft lever for high normal governed rpm and to lower hole for lower normal governed rpm.

** If governed fast idle is not within specified limits with no bumper spring contact, modify governor spring to obtain correct speed. NOTE: If bumper spring contact is necessary to prevent surging after correct spring has been worked out, fast idle speed must still be within specifications.

*** Attach spring assembly in upper hole in governor fork shaft lever.

ISS-1012-Y. 3-61.
PRINTED IN UNITED STATES OF AMERICA

PLUNGER IDENTIFICATION CHART

Symbol Stamped on Plunger Stem	Plunger Unit Assembly	Plunger and Bushing Assembly	Plunger	Plunger Diameter	Land Dimension	Upper Helix	Lower Helix
OLD-D-9 or 014 R1 NEW- B	66 110 DC 257 880 R93	255 014 R11 257 878 R11	255 014 R1 257 878 R1	.375	.140 .139	.125 .124	.547 .548
OLD-D-14 or 017 R1 NEW- A	66 111 DC 257 881 R93	255 017 R11 257 877 R11	255 017 R1 257 877 R1	.375	.140 .139	.125 .124	.787 .788
OLD-D-6 or 015 R1 NEW- F	69 706 DC 261 898 R92	255 015 R11 261 847 R11	255 015 R1 261 847 R1	.375	.130 .129		.400 .401
OLD-Short or 016 R1 NEW- G	251 028 R95 261 899 R93	255 016 R11 261 848 R11	255 016 R1 261 848 R1	.375	.140 .139	.125 .124	.547 .548
OLD-D-24 or 435 R1 NEW- C	253 956 R95 261 900 R92	256 435 R11 261 843 R11	256 435 R1 261 843 R1	.415	.125 .124		.643 .644
OLD-D-16 or 438 R1 NEW- D	256 467 R93 261 902 R92	256 438 R11 261 845 R11	256 438 R1 261 845 R1	.312	.099 .098		.869 .870
OLD-D-18 or 437 R2 NEW- H	256 468 R94 261 901 R92	256 437 R21 261 849 R11	256 437 R2 261 849 R1	.375	.130 .129		.643 .644
OLD-D-6 or 686 R1 NEW- E	256 689 R93 261 903 R91	256 686 R11 261 846 R11	256 686 R1 261 846 R1	.375	.130 .129	.125 .124	.547 .548
OLD-166-17-SC or 847 R1 NEW- K	263 846 R91 272 987 R91	263 847 R11 272 986 R11	263 847 R1 272 986 R1	.375	.167 .165		
OLD-Short or 016 R1 NEW- G	264 299 R91 264 300 R91	255 016 R11 261 848 R11	255 016 R1 261 848 R1	.375	.140 .139	.125 .124	.547 .548
OLD-181-17-SC or 380 R1 NEW- L	264 379 R91 272 989 R91	264 380 R11 272 988 R11	264 380 R1 272 988 R1	.375	.182 .180		
OLD-D-6 or 015 R1 NEW- F	265 037 R91 266 565 R91	255 015 R11 261 847 R11	255 015 R1 261 847 R1	.375	.130 .129		.400 .401
OLD-547 or 709 R1 NEW- J	267 710 R91 272 985 R91	267 709 R11 272 984 R11	267 709 R1 272 984 R1	.375	.120 .119		.547 .548
OLD-340 R1 NEW- M	272 341 R91 272 991 R91	272 340 R11 272 990 R11	272 340 R1 272 990 R1	.375	.130 .129		.787 .788

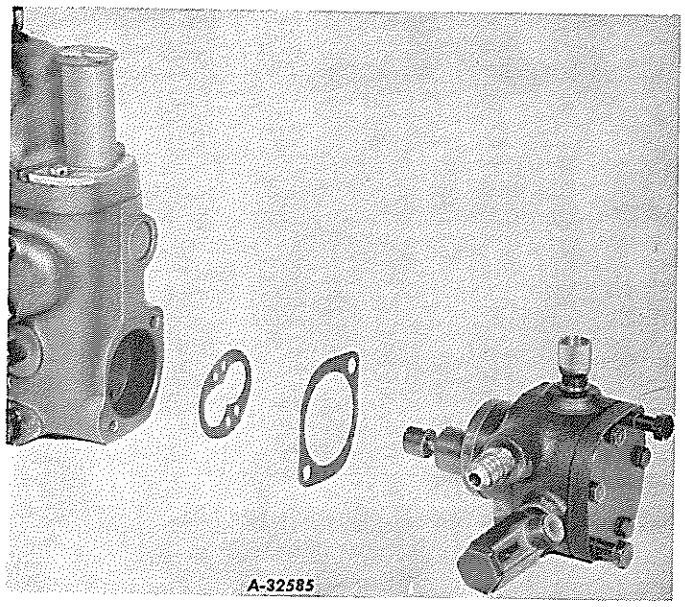
INJECTION PUMP COMPONENTS WHICH CAN BE REPLACED

STEP 38 - Primary Pump

Remove the primary and scavenging* pump unit.

Replace gaskets.

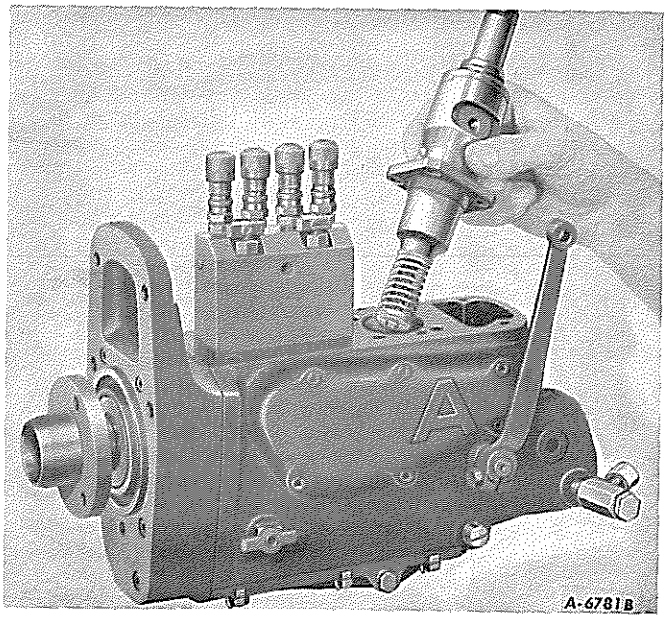
*"B" series pumps have no scavenging system.



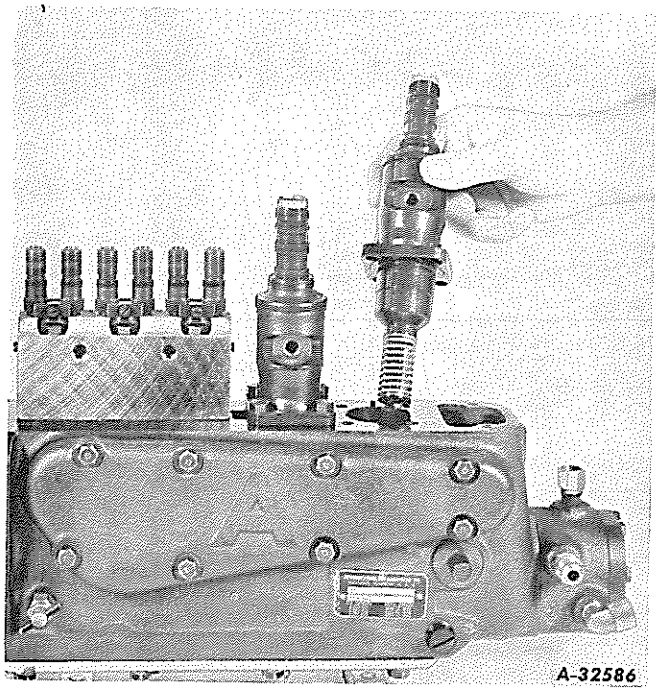
Primary Pump Removed. ("A" type shown)

STEP 39 - Plunger Units

A - Remove plunger units.



Single-Plunger Pump.

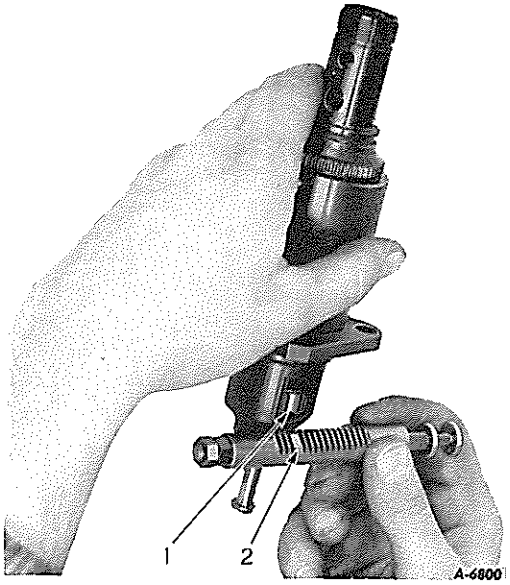


Twin-Plunger Pump.

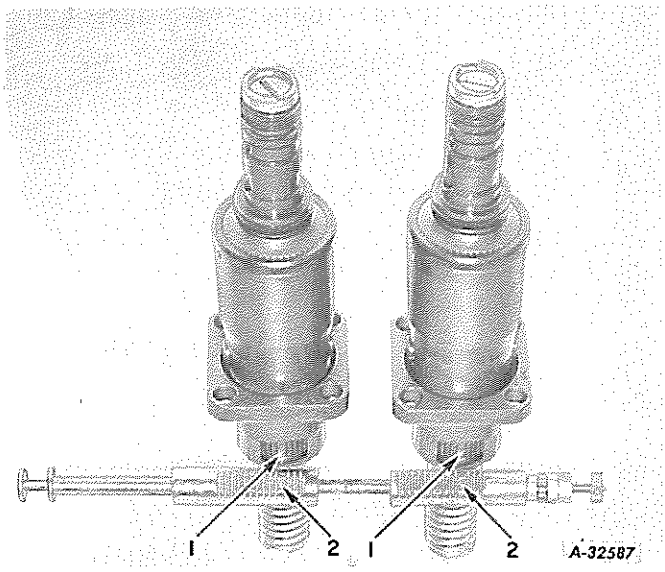
Lift Plunger Unit From The Injection Pump.

PRINTED IN UNITED STATES OF AMERICA

B - Install plunger units.



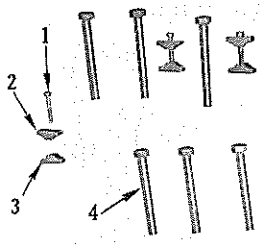
Single-Plunger Pump.



Twin-Plunger Pump.

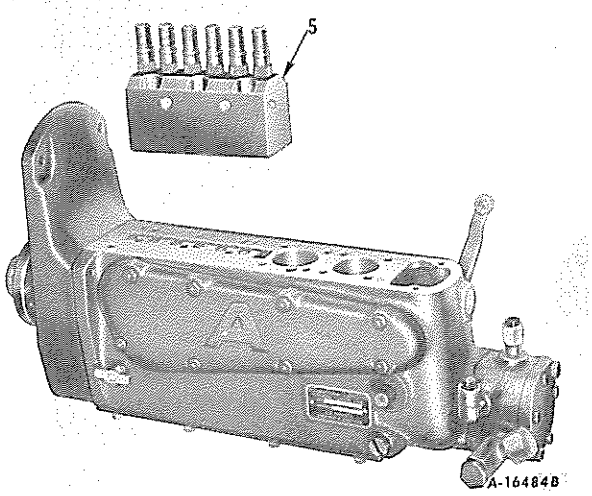
(Plunger Unit and Rack, Showing Mating Points of Plunger Control Gear and Rack.)

1. Double Width Tooth Space Of Plunger Control Gear.
2. Double Width Tooth On Rack.



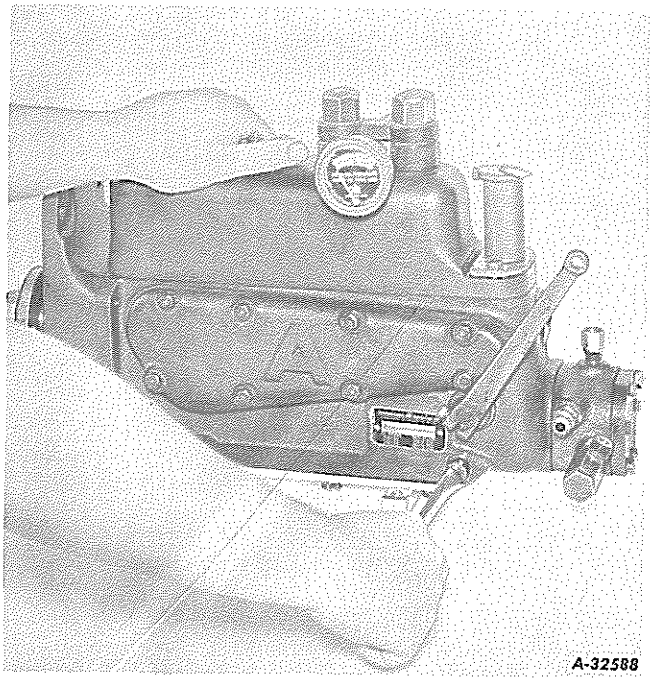
STEP 40 - Distributor Block

Distributor Unit Removed From Injection Pump Housing - One Piece Block.

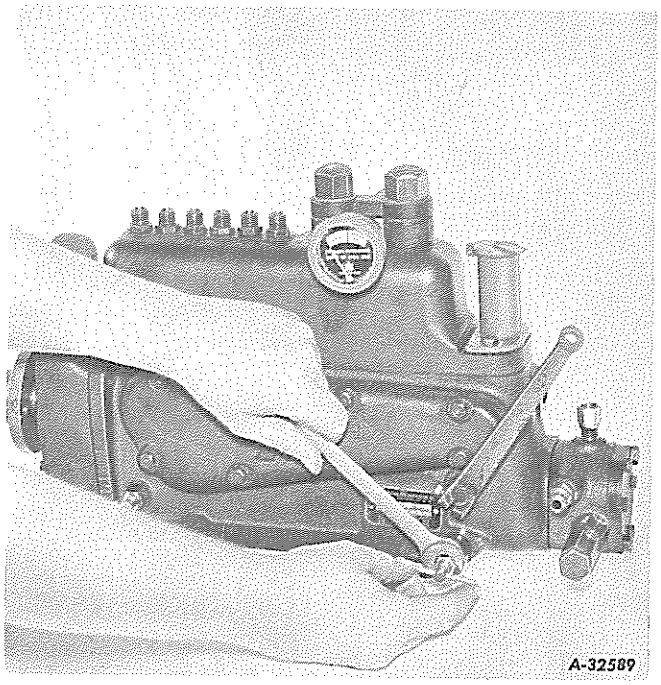


1. Discharge Fitting Lock Screw.
2. Discharge Fitting Lock.
3. Discharge Fitting Lock Nut.
4. Cap Screw For Holding Distributor Unit.
5. Distributor Unit.

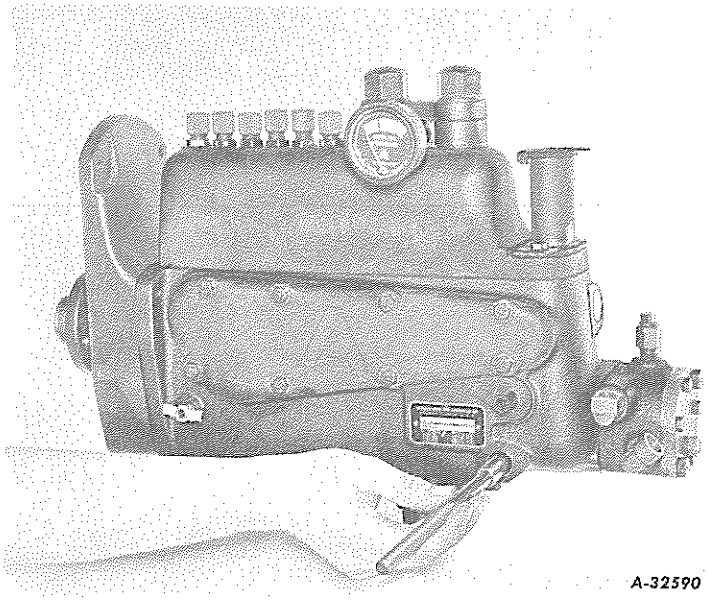
STEP 41 - Scavenging Valve ("A" Pump Only)



Removing Scavenging Valve Cap.



Use Special Tool SE-1330-1 To Remove Scavenging Valve Body.

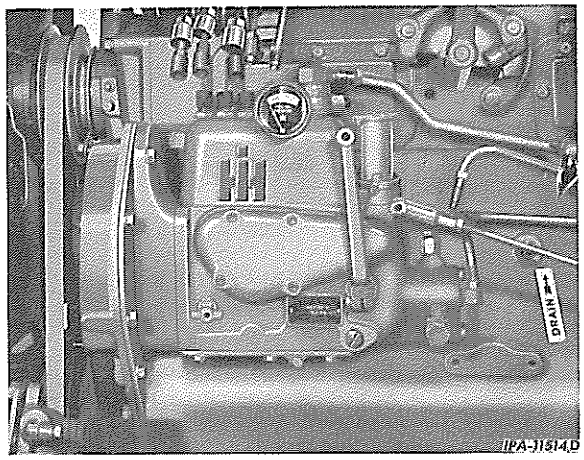


Use Special Tool SE-1330-6 To Remove Scavenging Valve Tappet and Tappet Guide.

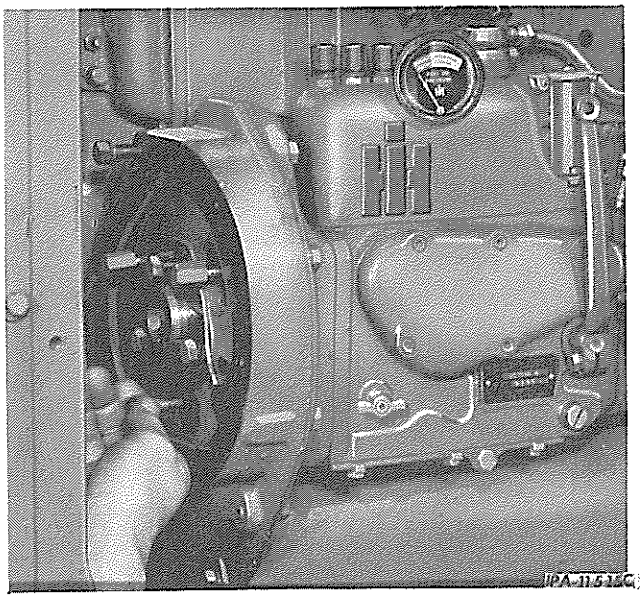
PRINTED IN UNITED STATES OF AMERICA

STEP 42 - Remove, Install and Time Injection Pump

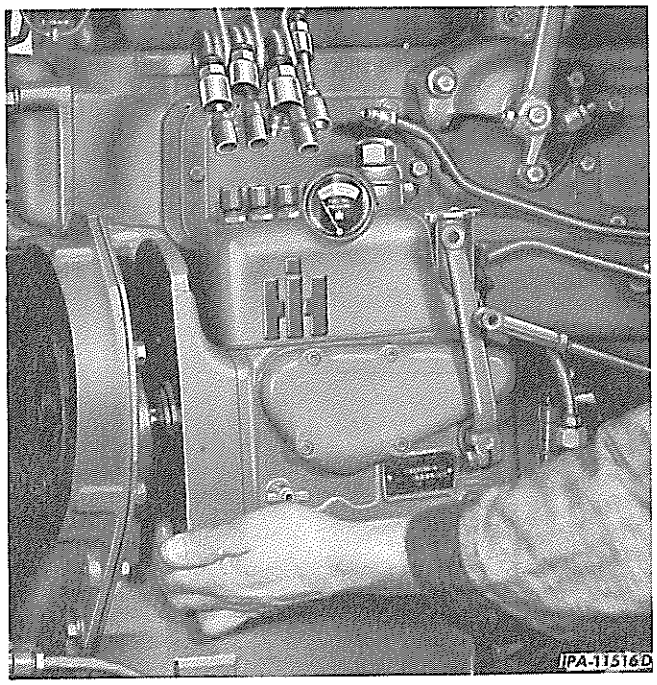
A - Remove injection pump.



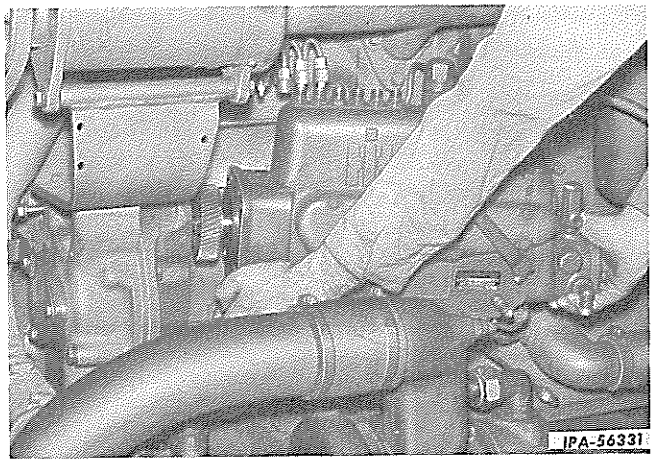
Disconnect Fuel Pipes From Injection Pump.



Removing Cap Screws Which Secure Pump Mounting Flange to Crankcase Front Plate.



Remove the Injection Pump.



Removing The Injection Pump (817 Series).

B - Install injection pump.

To install the injection pump, reverse the procedure given above for removal.

NOTE: Because the 817 series engine is equipped with a "C" type (engine oil lubricated) pump and is timed to the engine when installed, detailed instructions are given.

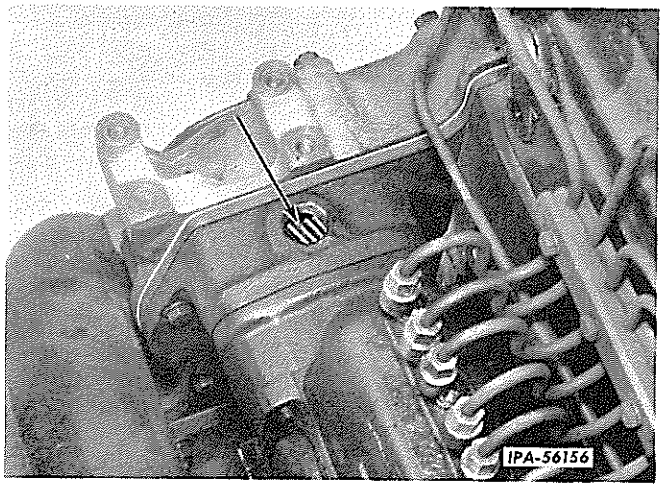
817 SERIES ONLY: The timing of the injection pump to the engine is not adjustable, as in other International engines using a similar injection pump. The time of injection on the 817 engine is controlled by the injector cam on the camshaft; however, the pump must be timed to the engine in order to deliver the correct amount of metered fuel to the injector.

When installing the "C" type injection pump to the 817 series engine follow this timing procedure:

(a) Rotate the crankshaft until the 1 and 6 TDC mark on the vibration damper indexes with the timing pointer. The number 1 cylinder must be on the compression stroke.

(b) Remove the 3/4 inch pipe plug from the top of the injection pump drive housing.

(c) Install the injection pump with the chamfered tooth on the pump drive gear facing up as shown in the following illustration:



Chamferred Tooth Positioned For Timing The "C" Pump To The 817 Series Engine.

(d) When the injection pump is in place, the chamfered tooth on the front side of the drive gear must index with the center of the hole in the injection pump drive adapter.

To check the timing when the pump is mounted and the system has been primed, remove the No. 1 injection line. With the throttle control lever in the maximum fuel position, rotate the engine crankshaft until fuel starts to rise in the fitting. This should occur 140 ± 5 engine degrees before TDC on the compression stroke. The vibration damper fins can be used as a degree wheel. There are 90 fins on the vibration damper, each fin equals 4 degrees. The Kiene test pump method cannot be used to determine timing due to the omission of the reverse check valve.

C - Timing Injection Pump ("A" and "B" Series)

1. FOR ENGINES WITH MAGNETO: Attach a jumper wire between the magneto terminal and the coil cover mounting bolt.

2. FOR ENGINES WITH DISTRIBUTOR: Disconnect the negative terminal cable from the coil cover on the distributor.

3. Remove the No. 1 spark plug. Crank the engine until the No. 1 cylinder is at top dead center of the compression stroke. (Note: The 16 series engines have the dead center mark on the damper. The 18, 18A and 24 series engines have it on the flywheel.)

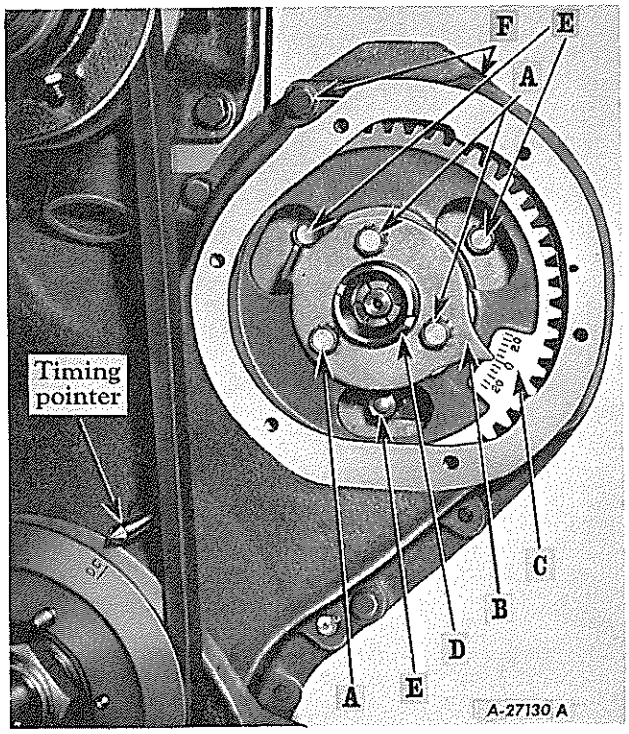
NOTE: Except as otherwise specified, the following paragraphs apply to the 6, 6A, 264, 281, 9, 9A, 350, 370, 14, 14A, 16, 525, 554, 24 and 1091 series engines.

4. Inspect the pump gasket and the cover gasket to be sure that they are clean and properly assembled into place.

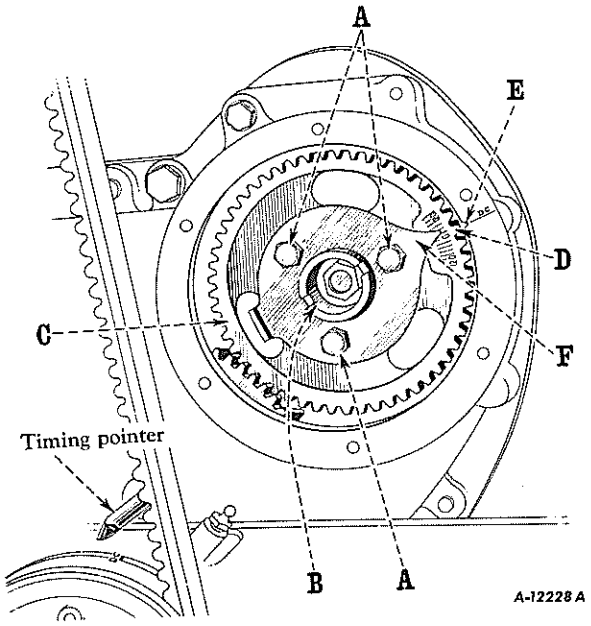
5. Assemble the injection pump to the engine and secure it with cap screws.

6. FOR 6, 6A, 264, 281, 9, 9A, 350, 370, 16, 525, 554, 24 AND 1091 SERIES ENGINES ONLY: Turn the injection pump gear hub "B" (see Illust. following so the groove on the hub and the groove on the face of the injection pump gear line up. Place the timing indicator "F" on the gear hub with the pointer at "O" position against the gear face. Bolt the hub, gear, and indicator together with the cap screws "A" in this position.

PRINTED IN UNITED STATES OF AMERICA



Adjustment Points For Injection Pump Timing On 6, 9, 350, 370, 16, 525, 554, 24 and 1091 Series Engines.



Adjustment Points For Injection Pump Timing on 14 and 14A Series Engines.

7. FOR 14 AND 14A SERIES ENGINES ONLY: Install the injection pump gear "C" (see next Illust.) on the drive hub "B" so the chamfered tooth "D" on the gear lines up with the "DC" mark on the front cover at "E." Never attempt to match the "K" marks on the injection pump gear and the idler gear.

8. FOR 6, 6A, 264, 281, 9, 9A, 350, 370, 14, 14A, 16, 525, 554, 24 AND 1091 SERIES ENGINES ONLY: Install the injection pump gear cover. Connect the controls, fuel lines, breather tube and injection lines.

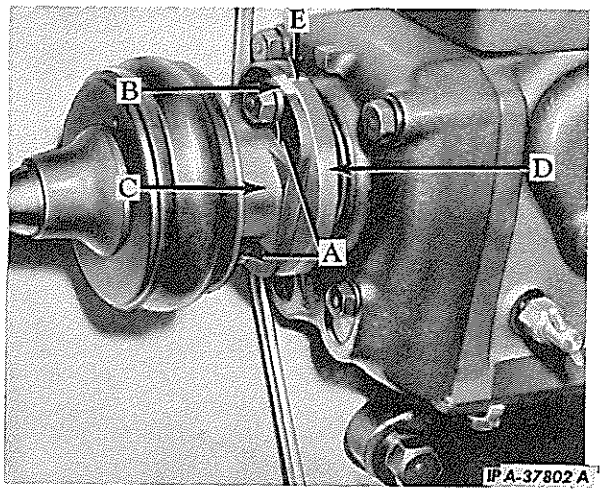
9. FOR ENGINES WITH MAGNETO: Remove the jumper wire from the coil cover mounting bolt to the magneto terminal.

10. FOR ENGINES WITH DISTRIBUTOR: Connect the negative terminal cable to the coil cover on the distributor.

11. Install the No. 1 spark plug. If the engine is equipped with an auxiliary fuel filter, turn on the fuel and vent the air from the filter.

TIMING FUEL INJECTION

NOTE: The paragraphs on this page apply to 18, 18A and 691 series engines only.



Injection Pump Coupling Showing Timing.

A timing adjustment is provided on the injection pump drive between the booted coupling and the injection pump. This adjustment is to compensate for differences in fuel, eventual timing gear wear, and when pumps are replaced, in order to maintain fuel injection at peak efficiency.

The pump drive flange "D" is marked with a V-groove at "E" for gauging the degree of adjustment. Timing coupling "C" has an adjustment indicator at "B" that consists of seven notches graduated two degrees apart. The adjustment is normally set with the V-groove lined up with the center notch on indicator "B" but, due to variations, the V-groove may be set either way from the center notch to obtain efficient fuel injection and smoother engine operation.

However, if and when the engine smokes at high idle speed, it is usually an indication of fuel waste. Loss of power under load may be caused by incorrect fuel injection timing. A white smoke, at high idle speed, generally is a sign that fuel is being injected into the engine too early. A dark smoke usually indicates late fuel injection.

NOTE: Facing the injection pump cover, turn flange "D" clockwise to advance fuel injection to overcome dark smoke; turn "D" counterclockwise to retard fuel injection to eliminate white smoke.

To maintain engine performance, adjust the pump fuel injection timing as follows:

(1) Warm up the engine to operating temperature; then stop the engine and crank it until the timing markings are visible.

(2) Loosen cap screws "A" and turn pump drive flange "D" to move V-groove one notch at a time either way from it's present setting at "B," depending upon whether advance or retard is required.

(3) Tighten cap screws "A" after each one-notch setting has been made between "E" and "B," and operate the engine at high idle to observe result of the adjustment. Repeat adjustment until exhaust is clear; then backup 1/4 notch at a time until the engine operation is smooth with the cleanest exhaust.

Timing couplings are made so that they can be assembled only one way for correct timing of the pump with relation to the crankshaft.

PRINTED IN UNITED STATES OF AMERICA

This fuel injection pump timing chart is a guide for pump timing of I.H. Construction Equipment Diesel Engines when a new pump is installed or after engine overhaul.

The abbreviation N.R. shown in last column means "notches retarded."

The abbreviation N.A. shown in last column means "notches advanced."

One notch equals four (4) degrees of engine crankshaft rotation.

Unit	Rated Load Speed (rpm)	Pump Timing
6 Series Diesel Engines, UD-264 and UD-281-4 Power Unit Engines	900 to 1800	0 to 1/2 N.A.
9 Series Diesel Engines, UD-350 and 370 Power Unit Engines	900 to 1800 2000 and above	0 to 1/2 N.A. 1-1/2 N.A. to 2 N.A.
14, 14A and 461 Series Diesel Engines	900 to 1400 1500 to 1800	0 to 1/2 N.A. 1 to 1-1/2 N.A.
554 Series Diesel Engines and UD-525 Power Unit Engines	900 to 1800 2000 and above	1-1/2 N.R. to 2 N.R. 1 N.R. to 1-1/2 N.R.
18A and 691 Series Diesel Engines	900 to 1600	1/2 N.R. to 1 N.R.
24 Series Diesel Engines and UD-1091 Power Unit Engines	900 to 1600	1 N.R. to 1-1/2 N.R.

In order to obtain the optimum timing it may become necessary to vary the recommended timing location to compensate for variations in fuel; and/or altitude.

Pump timing will be the same for open type nozzle valves and orifice type nozzle valves.

GENERAL

There are many things, other than the fuel injection system which may cause impaired engine operation. Before attempting to correct any problem by going into the fuel injection system, be sure that all other possible causes have been eliminated.

The proper method of checking the injection pump system is to do so in a systematic way by starting with the most frequent causes of failure which, incidentally, are the easiest to correct, and to eliminate them; then proceed to the causes more difficult to correct, eliminating one cause of failure at a time until the entire system has been checked.

Too much emphasis cannot be placed on the importance of cleanliness when working on a fuel injection system.

PROBABLE CAUSE	REMEDY
Insufficient or No Fuel Reaching Injection Pump	
1. No fuel	Fill fuel tank and bleed entire fuel system.
2. Fuel shut-off valve completely or partially closed	Open shut-off valve underneath fuel tank.
3. Foreign material in fuel tank	Clean fuel tank.
4. Excessive water in air and water trap	Drain and clean.
5. Fuel cap vent holes clogged	Clean vent holes, or if necessary, replace cap.
6. Air in fuel system	Bleed air from fuel system.
7. Fuel lines leaking	Inspect all fuel lines for leakage and tighten connections.
8. Fuel supply pump inoperative	Test fuel supply pump; if necessary replace.
9. Fuel strainer or water trap clogged	Remove and clean.
10. Fuel filters clogged	Remove and replace elements.
11. Fuel lines clogged	Clean or replace clogged lines.
12. Priming valve in wrong position	Reposition valve. Check priming procedure.
13. Air leaks in suction fuel line to primary pump	Replace suction fuel line.
Injection Pump Does Not Deliver Fuel to Engine	
1. No fuel	Fill fuel tank and bleed the fuel system.
2. Fuel shut-off valve closed	Open shut-off valve.
3. Speed control linkage defective	Adjust or replace linkage.
4. Fuel leakage	Tighten all connections or replace worn parts.
5. Fuel supply pump defective:	
a. Belt worn or broken	Replace belt.
b. Belt tension incorrect	Adjust to correct tension.
c. Drive shaft broken	Replace supply pump.
6. Defective nozzles or injectors	Replace or repair.
7. Air in fuel system	Bleed air from fuel system.
8. Defective primary pump:	
a. Coupling broken	Replace primary pump or drive shaft.
b. Drive gear key sheared	Replace primary pump or key.
c. Primary pump shaft broken	Replace primary pump or shaft.
9. Clogged fuel filters	Replace filter elements.
10. Fuel lines clogged	Clean or replace.
11. Injection pump not turning:	
a. Drive gear bolts loose or missing	Replace or tighten.
b. Drive gear key sheared or missing	Replace.
12. Rack binding	Replace pump or overhaul injection pump.
13. Plunger stuck in bushing	Replace plunger or plunger and bushing.
14. Broken camshaft	Replace or overhaul injection pump.
15. Broken governor shaft	Replace or overhaul injection pump.
16. Plunger tappet stuck in bushing	Replace or overhaul injection pump.
17. Injection pump delivery valves dirty or sticky	Inspect and clean delivery valve holders

PRINTED IN UNITED STATES OF AMERICA

PROBABLE CAUSE	REMEDY
Pump Sump Oil Decrease *	
1. External leakage	Tighten bottom plate cap screws.
2. Plunger tappet loose in bushing	Check for proper clearance. Replace if necessary.
Pump Sump Dilution	
1. Scavenging valve, seals and gaskets leaking	Replace scavenging valve, seals and gaskets.
2. No fuel return from scavenging pump	*Clean primary pump and check scavenging gears.
3. Clogged fuel return line	Remove and clean.
4. Clogged injection pump breather pipe or breather air cleaner (oil will be black)	Remove and clean.
5. Defective camshaft oil seal (oil will be black)	Replace seal in pump flange.
6. Discharge fittings loose in distributor block	Tighten to specified torque.
7. High pressure pipes leaking:	
a. Faulty gaskets	Replace with new.
b. High pressure screws are loose	Tighten to specified torque.
8. Plunger bushing clamp loose	Tighten to specified torque.
9. Defective primary pump seal	Install new seal.
10. Defective bearing cage gasket	Install new gasket.
11. "A" bottom plate gasket installed ("B" pump only)	Install "B" bottom plate gasket.
Crankcase Dilution	
1. Discharge fittings loose in distributor block	Tighten to specified torque.
2. High pressure pipes leaking:	
a. Faulty gaskets	Replace with new.
b. High pressure screws loose	Tighten to specified torque.
3. Plunger bushing clamp loose	Tighten to specified torque.
4. Defective primary pump seal	Install new seal.
5. Defective bearing cage gasket	Install new gasket.
6. Leakage at injector fittings. Remove the valve covers and look for wash marks at:	
a. Inlet fitting, loose or damaged	Loose fittings should be tightened or replaced.
b. Fuel inlet elbow lock nut loose or not sealing	Tighten or replace.
c. Damaged or improperly installed fuel line connections	Replace fittings and install properly. Refer to Section 2, ISS-1003, "Injection Pump Service Manual" for installing procedures.
d. Fuel return lines collapsed or restricted fittings	Replace fuel lines and/or fittings.
Engine Dies at Low Idle Speed	
1. Cool engine temperature	Bring to operating temperature.
2. Plunger scored and sticking	Replace plunger and bushing.

* Not 817 Series "C" Pump.

PROBABLE CAUSE	REMEDY
Uneven Operation	
1. Low operating temperature	Bring temperature up to the operating point.
2. Fuel leakage	Tighten all connections and replace necessary parts.
3. Improper rack adjustment (Twin-plunger)	Adjust rack.
4. Defective nozzle or injector	Repair or replace.
5. Pump timing gears out of time	Check and reset timing.
6. Loose nut on end of camshaft	Torque nut to specified torque.
7. Distributor valve spring broken	Replace distributor or spring.
8. Injection pipes with different inside diameters	Replace with correct pipes.
9. Injection pipe crimped or partially clogged	Clean or replace
Engine Surging at High, Intermediate or Low Idle	
1. Binding in internal linkage	Overhaul complete injection pump.
2. Interference between inner and outer springs or by insufficient stretch or pick-up of the spring	See governor spring assembly chart for correct dimensions.
3. Friction between plunger and rack	Loosen cap screws that hold plunger, and tap plunger lightly away from rack.
4. Occasionally sticking plunger or tappet	Overhaul plunger unit or replace tappet and bushing.
5. Friction in plunger	Replace or overhaul plunger.
6. Friction in governor	Replace or overhaul injection pump, retorque governor fork shaft nut to specified torque.
Loss of Power	
1. Excessive friction, faulty metering	Complete injection pump overhaul.
2. Faulty injectors (817 series only)	Recondition injectors.
Surging Under Load	
1. Clogged air cleaner	Remove and clean.
2. Clogged filters	Install new elements.
3. Improper timing	Adjust timing.
4. Nozzles leaking	Remove and repair or replace.
5. Loosening of adjustments	Readjust pump.
6. Restriction to fuel delivery (low primary pump pressure)	See "Insufficient or No Fuel Reaching Injection Pump."
7. Loose plunger bushing clamp	Tighten to specified torque.
8. High pressure pipes leaking:	
a. Defective gaskets	Replace with new.
b. High pressure screws are loose	Tighten to specified torque.
9. Stuck or broken fuel return spring	Install new spring.
10. Plunger scored, stuck, or worn excessively.	Install new plunger and bushing.
11. Plunger tappet tight or stuck in the bushing.	Install new plunger tappet and bushing.
12. Precombustion chamber installed incorrectly	Remove and replace correctly.
Injection Pump Does Not Shut-off	
1. Improper adjustment of the shut-off stop screw	Adjust properly.
2. Control linkage out of adjustment	Adjust properly.

ISS-1012-Y. 3-61.

PRINTED IN UNITED STATES OF AMERICA

PROBABLE CAUSE	REMEDY
Excessive Fuel Consumption	
1. Improper adjustment	Readjust pump.
2. Leakage	Check for leaks and tighten all connections.
Noisy Tubocharger Operation or Vibration*	
1. Bearings are not being lubricated	Supply required oil pressure, clean or replace oil line, or clean oil strainer. After correcting the condition, replacement of the rotating cartridge assembly may be required.
2. Leakage in engine intake or exhaust manifold	Tighten loose connections or replace manifold gaskets if necessary.
3. Excessive build-up of dirt in compressor or impeller	Thoroughly clean all dirt from compressor impeller or replace rotating cartridge assembly if bearing clearances are greater than allowed. Clean air cleaner and check air inlet ducting for leakage.
4. Excessive build-up of carbon or deposits on turbine wheel	Replace rotating cartridge assembly.
5. Excessive bearing wear or damaged turbocharger	Repair or replace.
Turbocharged Engines Will Not Deliver Rated Power*	
1. Clogged manifold system	Clear all ducting.
2. Foreign material lodged in compressor or impeller, or turbine wheel	Replace rotating cartridge assembly.
3. Leakage in engine intake or exhaust manifold	Tighten loose connections or replace manifold gaskets if necessary.
4. Rotating cartridge assembly bearing seizure	Replace rotating cartridge assembly.

*Detailed instructions for rebuilding turbochargers will be found in ISS-1047.

IMPORTANCE OF CLEAN DIESEL FUEL

Keeping fuel and fuel containers clean quite often requires time that, to the operator and even to the owner, seems wasted. This is especially true when a time limit is set to complete a work contract. However, the injection pump is the heart of the diesel engine. Precision workmanship and the best materials have been built into the fuel injection equipment to assure the best possible performance. This performance cannot be obtained under any circumstances with any injection equipment unless the fuel is kept free from dirt and water. Therefore, in view of proven records, time and money are saved when care is taken to follow the instructions necessary to keep diesel fuel clean. Refer to the operator's manual for instructions on diesel fuel storage.

DIESEL FUEL SPECIFICATIONS

Refer to the latest Fuel and Lubricant Service Bulletin. Fuels and lubricants must meet specifications to give the desired results.

STORING INSTRUCTIONS

Refer to the operator's manual.