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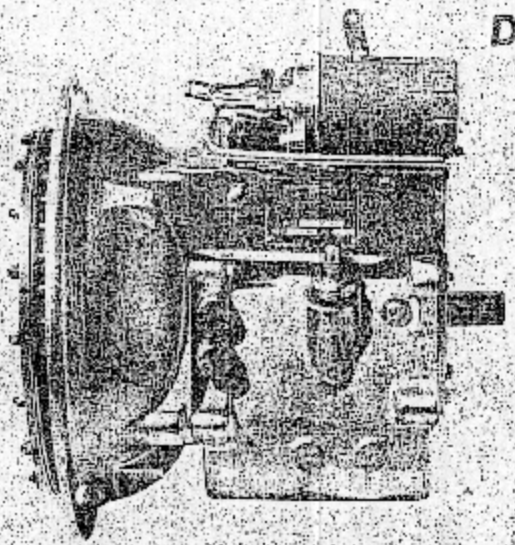
Funk MFG. CO. DIVISION OF GARDNER-DENVER

FUNK

reversomatic DRIVES



SERIES - RC

INSTRUCTION-PARTS MANUAL

FUNK MFG. CO.

COFFEYVILLE, KANSAS 67337 PHONE AREA 316 - 251-3400 1211 W. 12th STREET

REVERS-O-MATIC DRIVE

Designed specifically for off-highway, forward-reverse, and lift-lower operations, the FUNK REVERS-O-MATIC DRIVE is particularly adaptable to equipment such as road rollers, industrial tractors and loaders, garbage trucks, and various other types of industrial equipment. Extremely compact, the unit can generally be installed by original equipment manufacturers without major re-design problems. The unit is available for engines with S.A.E. No. 2, 3 and 4 Flywheel Housings.

Before attempting any repairs on this unit, it is advisable that you request a Revers-O-Matic Drive Repair Manual which completely describes and illustrates the assembly and disassembly of your unit. This Booklet will be forwarded postpaid upon receipt of $1.00 per copy.

Should repair parts be required, please specify the model, specification, and serial numbers of your unit as well as the name and number of the parts accompanying your purchase order.

The above information will greatly facilitate the handling of your service order.

Thank you,
THE FUNK MFG. COMPANY

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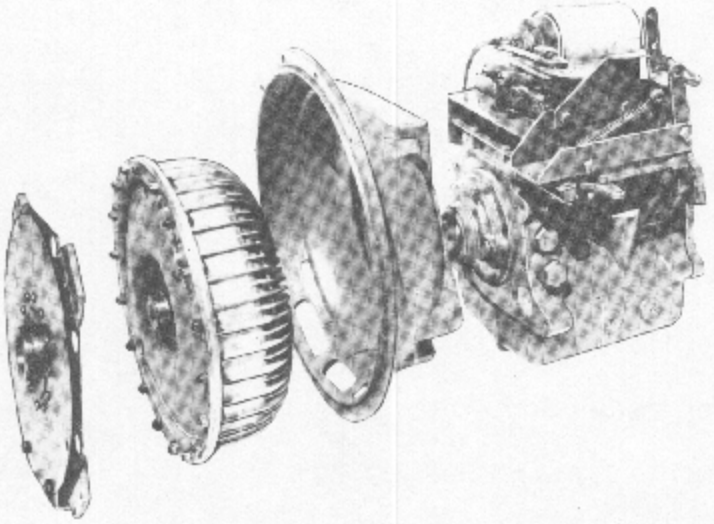
MODEL IDENTIFICATION



Model RC is a 7004 Revers-O-Matic assembly with the 7250 control assembly. Unit has a 17 tooth input shaft spline and 1⅜-10 output shaft spline x 2⅜" long.

Model RCA is the same as Model RC with the addition of a torque converter and converter housing.

Model RCS is the same as Model RC except with a 29 tooth input shaft spline.

Model RCO is the same as Model RC except the output shaft spline is 1⅞" long.

DESCRIPTION

The Revers-O-Matic Drive consists of a pair of hydraulically actuated multiple disc clutches. When the front clutch is engaged, the output shaft turns engine-wise and in most applications this produces forward motion. The rear clutch is driven by a simple gear train and its rotation is opposite to the front clutch. Therefore, when the rear clutch is engaged, the output shaft turns anti-enginewise and in most applications this produces rearward motion.

The power is transmitted from the engine to the Revers-O-Matic Drive through a torque converter. The use of a torque converter has two distinct advantages. First, the converter is essentially a fluid drive, there being no direct mechanical connection through it. This feature creates a very smooth and shock-free drive with the elimination of engine stalling and lugging. Secondly, the converter multiplies torque, but only during heavy pull-down loads. When loads are light, the converter transmits the engine power directly at almost engine speed and there is no torque multiplication. The net result is an action like a transmission, with infinitely variable and automatic speed ratios. The need for shifting gears, although present, is greatly reduced.

The Revers-O-Matic Drive is equipped with a very unique control system; this being a device that sorts out motions from a single hand lever or double foot accelerator pedals that first engages one of the clutches and then accelerates the engine as the lever or pedal is moved further. Therefore, it is a unified control that regulates both the direction of travel and the speed of travel. Movement of the lever from a neutral position in one direction produces forward motion, and opposite movement of the lever produces rearward motion. The action of the foot pedals is essentially the same, except that one pedal produces forward motion and the other rearward motion.

CAUTION:

The clutches are not power absorbing members and must not be subjected to slippage under power.

The clutch must be engaged prior to accelerating the engine when the vehicle is to be moved or direction changed.

The clutches are hydraulically applied and spring released. Each clutch has six friction plates which have sintered bronze facings and six reaction plates of polished steel. Because the clutches are hydraulically controlled, there is automatic compensation for normal wear - no adjustment is necessary.

OPERATION

Like all mechanical equipment, the Revers-O-Matic will need attention and servicing. Routine checks will help prevent down-time. The operator can aid in preventive maintenance by keeping a watchful eye; reporting weak or borderline malfunctioning.

Because the unit operates "in" oil and "by" oil, most of the maintenance is concerned with oil replenishment and oil cleanliness.

RULES OF OPERATION

1. Check oil level daily, stopping engine before check. Make sure area around oil fill is clean before removing dip stick.
2. Always shift the Revers-O-Matic to neutral before starting the engine, or when the vehicle is parked and the engine is running.
3. Engage forward and reverse clutches at idle speed only. The clutches are not power absorbing members and must not be subjected to slippage under pressure.
4. Use brakes to slow or stop motion before applying the opposite clutch.
5. If the oil temperature gauge which is the converter oil "Out" temperature rises above 250°F. or the warning light comes on, stop the vehicle immediately. Shift Revers-O-Matic to neutral and run the engine at 1000-1200 R.P.M. The temperature should drop rapidly to the engine water temperature (within minutes). If the temperature does not drop, trouble is indicated. The cause of trouble should be determined before further operation of the vehicle; refer to "TROUBLE SHOOTING" instructions to be found elsewhere in this manual. Generally when overheating does occur, it is due to rapid reversals in the higher gear ratios. Shifting to a lower gear will help eliminate overheating due to this cause.
6. Do not shut off the engine when the unit is overheated.

SERVICE

THE FUNK MFG. COMPANY recommends the use of the following types of lubrication oils.

Revers-O-Matic Drive and Torque Converter Oil . . . Use type "A" automatic transmission fluid or equivalent.

NOTE! - The Revers-O-Matic and converter have a common fill located on the side of the Revers-O-Matic case.

When servicing your unit for the first time, fill the Revers-O-Matic Drive to the overflow level with the recommended lubricant. This will take approximately 6 quarts. Start engine and run at idle speed for one minute. Stop engine and add 4 more quarts of fluid; most of the original fluid being required to fill the converter. Check the oil level with the dipstick, adding oil if necessary to bring the level up to the low mark when unit is cold, or the full mark when unit is warm. Run the engine for at least five minutes and recheck the oil level.

1. Always use clean oil and clean containers.
2. Do not overfill. Clean around oil fill hole before checking level or adding oil.
3. Change all lubricating oils and oil filter after the first 20 hours of operation.
4. Thereafter and under normal operating conditions it is recommended that all lubricating oils and oil filter be changed after every 500 hours of operation or sooner if visual inspection of oil shows contamination. The oil filter is an AC Type PF-2 and is readily available throughout the United States.
5. Always clean the magnetic drain plugs before replacing.
6. Always check the oil level of the Revers-O-Matic Drive immediately after stopping the engine.
7. Keep all joints in the control system properly lubricated with heavy grease.
8. If radiator on the vehicle is drained during winter storage, the heat exchanger on the transmission must also be drained.

TROUBLE SHOOTING

The diagnosis of trouble in the transmission should always start by making certain preliminary checks before it is assumed that the transmission is at fault, or before carrying out any other trouble shooting procedures.

1. Check the coolant level in the engine radiator.
2. Check the oil level in the transmission. A low oil level can effect the operation of the transmission, and may indicate fluid leaks that could cause transmission damage. A high oil level can cause foaming of the oil which in turn may result in clutch slippage or leakage at the breather or filler tube.
3. Check the adjustment of the control and governor linkages. Make sure that the engine starts to rev up immediately after the pedal or lever leaves the neutral zone, and that the governor is being held wide open with pedal or lever in the full throttle position. All interferences that limit top R.P.M. should be remedied.

JERKING STARTS

If unit starts with a jerk, check the engine idle speed which is recommended at 450 to 550 R.P.M. If idle speed is lower than this, unit will die too easily in rapid reversals, and if higher, the converter will transmit too much torque for smooth starts. Maladjustment of the control system caused by excessive friction or external interference may cause the clutches to engage after the engine has started to accelerate. The control valve should be completely open before the engine starts to rev up. This is mandatory for smooth starts.

SLUGGISHNESS

Check engine for proper operating performance (refer to the performance check on Page 9). Adjust the rod from the control system to the governor so that the engine starts to rev up immediately after the control valve is opened.

All interferences that limit top R.P.M. should be remedied.

CLUTCH SLIPPAGE

Inspect the control valve and linkage for possible malfunction. Check the regulator valve for proper operating pressures as instructed under the performance check on Page 9. If the readings are other than normal, check for broken pressure regulator springs, make certain the valves are clean. Internally, inspect the clutch effected for possible damage. Check the oil pump for damage and improper performance.

CLUTCH FAILING TO RELEASE

First check for high oil level. Internally, inspect the clutch effected for burned, damaged or worn parts and replace as necessary. Check the alignment of the missing teeth on the separator plates with the oil drain holes in the clutch cylinder, making sure the drain holes are not clogged. If the output shaft exerts a turning force of 30 inch pounds of torque or more with the unit in neutral, corrective measures should be taken. This would require disassembly of the unit and inspection of all parts.

OVERHEATING

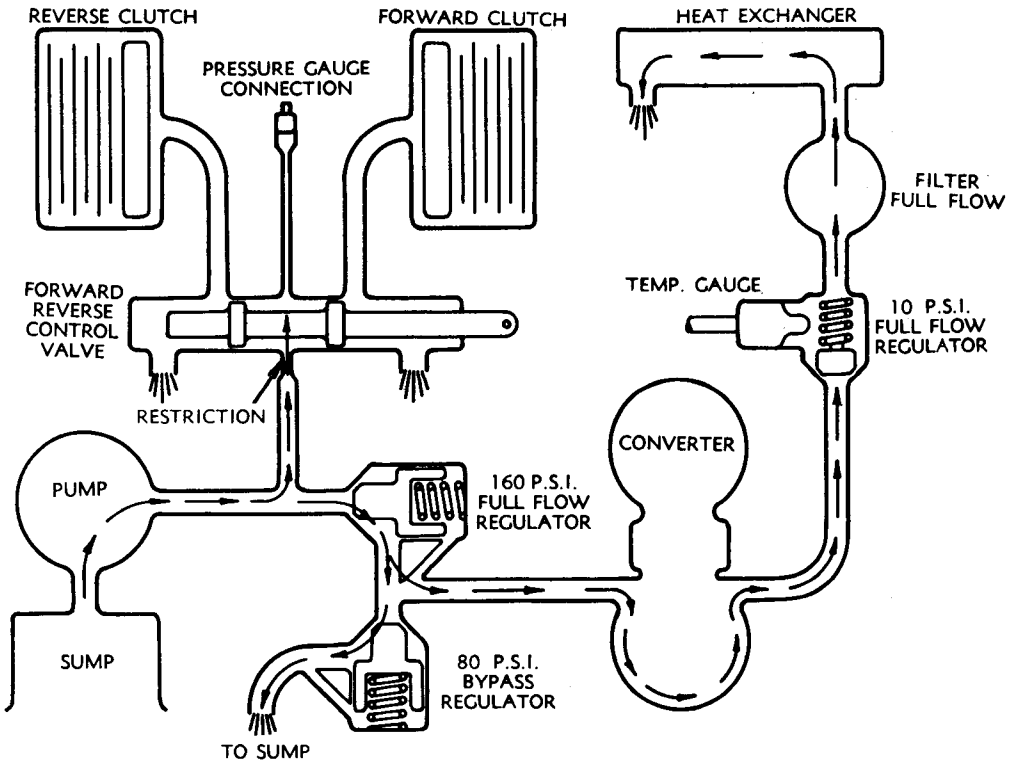
First, check for high oil level. Shifting to a lower gear will help eliminate the tendency to overheat. Inspect the heat exchanger and oil filter lines for obstructions and clean or replace as necessary. The possibility of insufficient oil flow to the heat exchanger caused by a worn or damaged oil pump should be checked. Inspect the oil filter for clogging.

NOISY CONVERTER

First, check for low oil level. Inspect the converter for worn or damaged parts. Check for damaged oil pump and replace if necessary.

HYDRAULIC FLOW DIAGRAM

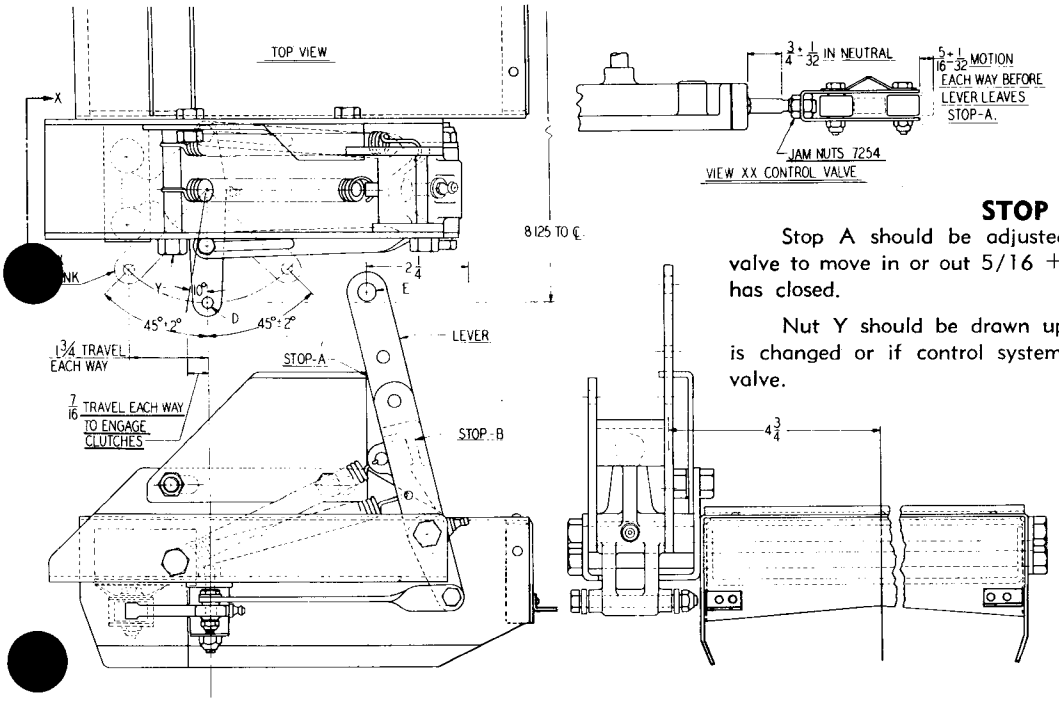
MODEL RC REVERS-O-MATIC (NEUTRAL)



CONTROL ADJUSTMENTS

ADJUSTMENTS

Centering control valve, adjust Jam Nuts to hold 3/4 + 1/32 dim. Shown when control system is in neutral.

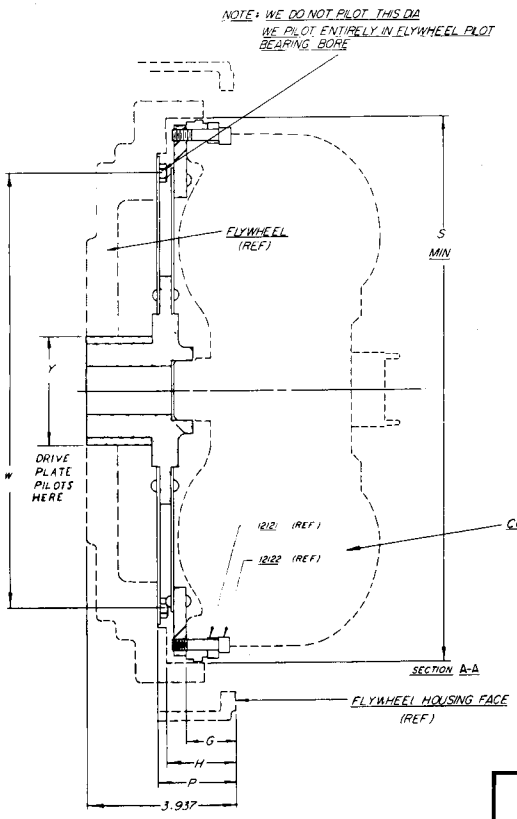


STOP ADJUSTMENTS

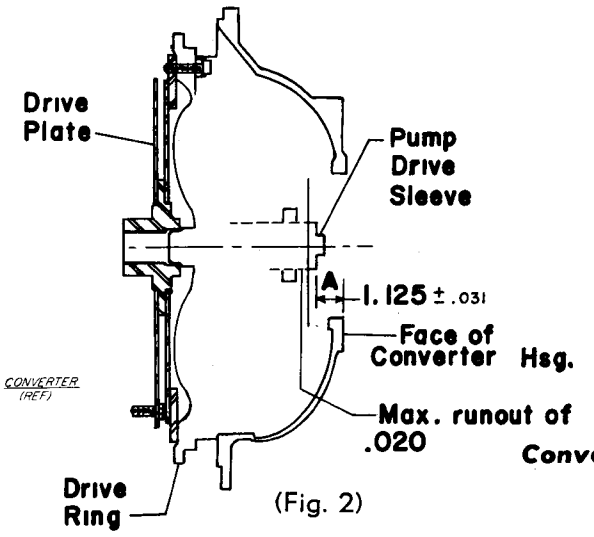
Stop A should be adjusted fore or aft to a position that will allow valve to move in or out 5/16 + 1/32 before lever leaves stop A and stop β has closed.

Nut Y should be drawn up snug but not tight—if tension on this nut is changed or if control system is replaced. Recheck centering of control valve.

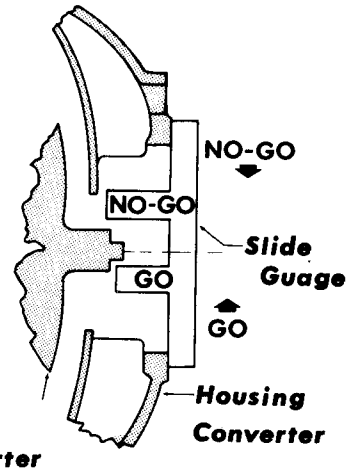
TORQUE CONVERTER INSTALLATION DATA



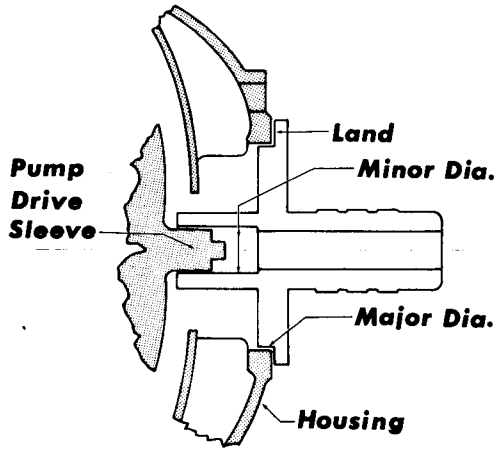
(Fig. 1)



(Fig. 2)



(Fig. 3)



(Fig. 4)

The 2 Drive Plate Assemblies Listed Below are Standards

Flywheel Housing	Flywheel	Converter	Y	Drive Plate Ass'y. No.	W	S	H	P	G	P-G
S.A.E. No. 2, 3, 4	S.A.E. 10"	12"	2.440 or 2.835 With Sleeve	12101	11.625	14½	1 15/16	2⅛	1⅜	¾
S.A.E. No. 2, 3, 4	S.A.E. 10"	11¾	2.440 or 2.835 With Sleeve	12101-K	11.625	14 5/16	1 15/16	2⅛	1⅜	¾

1. Preliminary checks should be made for the dimensions shown in Fig. No. 1, also the following must be within SAE tolerances before starting converter installation.
   A. Engine flywheel face runout.
   B. Engine flywheel housing pilot bore runout, and parallelism of mounting face in relation to flywheel.
2. Attach the converter drive plate assembly to the engine flywheel with the #F10030-12 capscrew (⅜ x ¾) and the #F16202 lockwasher supplied with the assembly. If the drive hub sleeve is required, it should be installed at this time.
3. Attach the torque converter to the converter drive plate with the #F11004-20NY socket head capscrew (5/16 x 1¼) and the #4012121 half round washer supplied with the assembly. Be sure the converter is positioned so that the drain plugs #45015 on the front side of the converter do not interfere with the drive plate.
4. Remove the converter housing from the Revers-O-Matic, and attach this to the engine flywheel housing. The capscrews and lockwashers for this are not ordinarily supplied.
5. The location of the pump drive end of the torque converter (shown as dimension "A" Fig. #2) must be checked on all installations. It will be necessary to hold the converter hub in the center position, due to the flexibility of the drive plate allowing the converter to tilt slightly.
6. The dimension "A" is to be 1.125 plus or minus .031 and may be checked with a depth mike, a closely graduated scale rule and a straight edge, or the #CDG-1 "Go" and "No-Go" gauge (see Fig. #3) is available for this check. The dimension "A" is to be checked at the end of the pump drive sleeve, and not at the ends of the two driving lugs. (See Fig. #2).

7. If dimension "A" is less than 1⅛" minus 1/32" or if the "Go" side of the #CDG-1 gauge will not slide by the end of the pump drive sleeve, it will be necessary to remove the converter housing and check for interference of the torque converter, converter drive plate, and engine flywheel, or possible damaged or deformed drive plate. If no interference is found, the thickness of the flywheel must be reduced, or metal shims may be installed between the converter housing and the Revers-O-Matic Drive.
8. If dimension "A" is more than 1.125 plus .031, the "No-Go" side of the #CDG-1 gauge will slide by the pump drive sleeve, shims may be installed between the engine flywheel and the converter drive plate. Plain washers not more than 1/16" thick may be used for this purpose.
9. The runout of the pump drive sleeve, which is not to exceed .020" maximum, is checked by using the #CRG-1 gauge (Fig. #4), which also checks for converter housing misalignment. The use of this gauge depends on a sense of feel. The #CRG-1 gauge slips over the pump drive sleeve and into the converter housing bore. This may require a slight lifting because the flexibility of the converter drive plate may allow the torque converter to tilt slightly. The gauge is then turned as the engine is turned over slowly. If the gauge turns freely through a full turn of the crankshaft, the converter and converter housing are in satisfactory alignment. If the gauge will not enter the converter housing bore, or the gauge does not turn freely as the engine is turned over, it will be necessary to recheck the tolerances noted in paragraph #1, as this would indicate the runout is in excess of the .020" limit.
10. Check that the oil pump drive lugs are set at right angles to the drive lugs on the converter pump drive sleeve. The full weight of the Revers-O-Matic must be suspended during installation to prevent damage to the oil seal at the front of the oil pump. The Revers-O-Matic should be rotated a few degrees each way during installation to mesh the spline connections inside the converter.

    NOTE: The Revers-O-Matic must be filled with oil per service instructions on page 4 before engine is started.
11. Attach the Revers-O-Matic Drive to the converter housing with the 4 #F10040-32 capscrews (7/16 x 2") and #F16203 lockwashers.
12. This installation refers to the standard 7250 control assembly shown on page 12. Connect the throttle rod between the throttle lever (point "E" page 7) and the governor spring. Throttle rod length is adjusted so the engine begins to rev up when the lever has left stop "A" by not more than 1/16". The rod from the operator's control is connected to the bellcrank (point "D"), being sure that the operator can articulate the bellcrank thru 45° each way, or until stop "C" closes.

PERFORMANCE CHECK

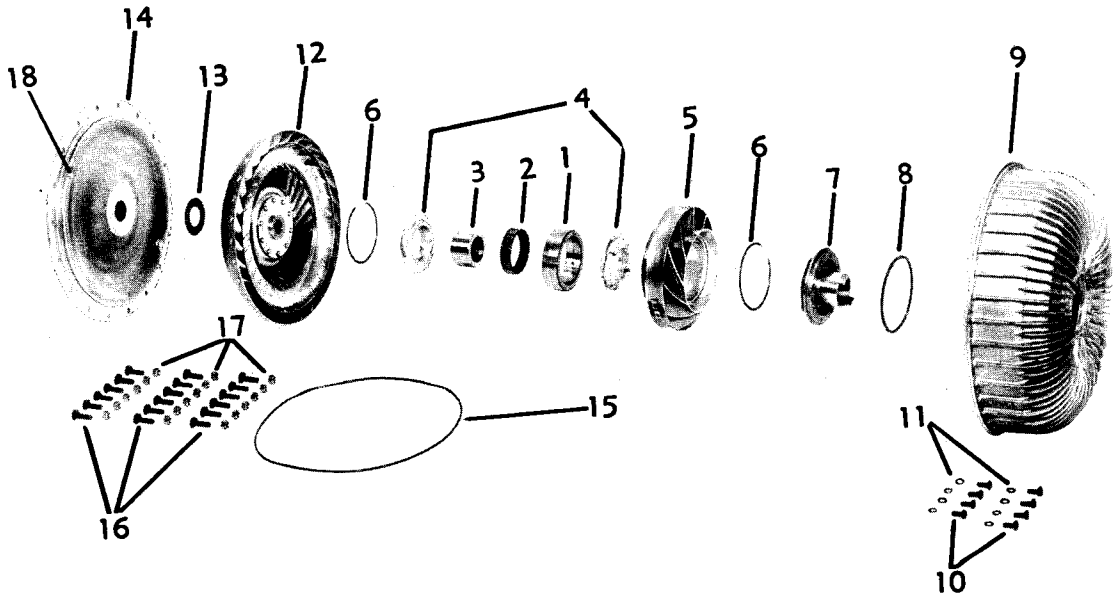
Attach a tachometer to the engine with the transmission in neutral. Holding the forward pedal or lever wide open, the engine should turn up to the top governor R.P.M. as shown on the specification sheet. If the R.P.M. is less than this, check the control and governor linkage to make sure that the governor is being held wide open, or tune up the engine. Check the R.P.M. with the reverse pedal or lever fully depressed. The engine speed should be the same as above.

Next, place the transmission in high gear and lock the brakes. Holding the forward pedal or lever wide open, the engine should turn up to the minimum static R.P.M. as shown on the specification sheet. If the R.P.M. is less than this, tune up the engine. If the engine speed is over the maximum static R.P.M. as shown on the specification sheet, the torque converter or the hydraulic clutches in the Revers-O-Matic are slipping. Repeat the same test, using the reverse pedal or lever.

If a check indicates that the converter or the Revers-O-Matic are at fault, first check the oil level of the unit as described under "Service" on Page 6. Next, check the control oil pressures. Install a 200# pressure gauge in the pipe fitting located on top of the control valve and at the front end of the Revers-O-Matic Drive. With the engine turning approximately 1500 R.P.M. the pressure should read 150 P.S.I. minimum. If less than this, remove and clean the pressure regulator valves as follows:

1. Remove the upper regulator cap on the left hand side of the unit near the front end of the case. Remove the spring, valve, and guide pin. Thoroughly clean the valve port as well as the various parts of the valve. Set the parts of the upper regulator valve aside so that they will not be mixed up with other parts later on.
2. Install the upper regulator cap **only** in the upper regulator valve port.
3. Remove the lower regulator cap, spring, valve and guide pin. Thoroughly clean the valve port as well as the various parts of the valve.
4. Reassemble the lower regulator valve complete, being sure that the valve slides freely in the valve port.
5. A pressure reading can now be taken on the lower regulator valve, using the gage previously installed. The lower regulator should be set at 75 to 80 P.S.I.
6. The pressure of the regulators can be adjusted by adding or removing washers under the springs in the regulator caps.
7. Remove the upper regulator cap and reassemble the upper regulator valve complete, being sure that the valve slides freely in the valve port.
8. The upper regulator valve should now be set so as to read 160 to 170 P.S.I. at 1800 R.P.M. in neutral. However, the pressure will drop momentarily below 100 P.S.I. when the clutches are engaged. With the engine idling, the regulator should read approximately 100 P.S.I.
9. With new oil in the unit, the pressure regulator valves may buzz. This is due to a foaming of the oil. Do not read the pressure gage when the regulator valves are buzzing. Idle the engine for several minutes, then rev up and read the pressure gage.
10. The 10# pressure regulator valve located on the right hand side of the unit is rarely a source of service problems. However, if the valve should require cleaning, follow the steps described above for the other two regulator valves.

CONVERTER ASSEMBLY



CONVERTER ASSY. NOS. 45001, 45022, 45027, 45030, 45031

ASSEMBLY NO. 45001

12" CONVERTER

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4045013	Race (Outer)	1
2	4045010	Sprag (One way clutch)	1
3	4045012	Race (Inner)	1
4	4045009	Washer - Stator Thrust	2
5	4045008	Stator Assembly	1
6	4045011	Snap Ring	2
7	4045003	Hub Impeller	1
8	4045006	Gasket - Hub to Impeller	1
9	4045002	Impeller Assembly	1
10	4045004	Cap Screw	8
11	4045005	Lock Washer	8
12	4045007	Turbine Assembly	1
13	4045016	Washer - Turbine Thrust	1
14	4045014	Cover Assembly - Front	1
15	4045017	"O" Ring Gasket	1
16	4045018	Bolt - Cover to Impeller	10
17	4045019	Lock Nut	10
18	4045015	Drain Plug	2

ASSEMBLY NO. 45022

(11¾ Hi. K) Converter Without Drive Ring

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4045013	Race (outer)	1
2	4045010	Sprag (one way clutch)	1
3	4045012	Race (inner)	1
4	4045009	Washer - Stator Thrust	2
5	4045025	Stator Assembly	1
6	4045011	Snap Ring	2
7	4045003	Hub - Impeller	1
8	4045006	Gasket - Hub to Impeller	1
9	4045023	Impeller Assembly	1
10	4045004	Cap Screw	8
11	4045005	Lock Washer	8
12	4045024	Turbine Assembly	1
13	4045016	Washer - Turbine Thrust	1
14	4045026	Cover Assembly - Front	1
15	4045017	"O" Ring Gasket	1
16	4045018	Bolt - Cover to Impeller	10
17	4045019	Lock Nut	10
18	4045015	Drain Plug	2

ASSEMBLY NO. 45027

(11¾ Hi. K) Converter With Drive Ring

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4045013	Race (outer)	1
2	4045010	Sprag (one way clutch)	1
3	4045012	Race (inner)	1
4	4045009	Washer - Stator Thrust	2
5	4045025	Stator Assembly	1
6	4045011	Snap Ring	2
7	4045003	Hub - Impeller	1
8	4045006	Gasket - Hub to Impeller	1
9	4045023	Impeller Assembly	1
10	4045004	Cap Screw	8
11	4045005	Lock Washer	8
12	4045024	Turbine Assembly	1
13	4045016	Washer - Turbine Thrust	1
14	4045028	Cover Assembly - Front	1
15	4045017	"O" Ring Gasket	1
16	4045018	Bolt - Cover to Impeller	10
17	4045019	Lock Nut	10
18	4045015	Drain Plug	2

ASSEMBLY NO. 45030

(11¾) Converter With Drive Ring

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4045013	Race (outer)	1
2	4045010	Sprag (one way clutch)	1
3	4045012	Race (inner)	1
4	4045009	Washer - Stator Thrust	2
5	4045025	Stator Assembly	1
6	4045011	Snap Ring	2
7	4045003	Hub - Impeller	1
8	4045006	Gasket - Hub to Impeller	1
9	4045029	Impeller Assembly	1
10	4045004	Cap Screw	8
11	4045005	Lock Washer	8
12	4045024	Turbine Assembly	1
13	4045016	Washer - Turbine Thrust	1
14	4045028	Cover Assembly - Front	1
15	4045017	"O" Ring Gasket	1
16	4045018	Bolt - Cover to Impeller	10
17	4045019	Lock Nut	10
18	4045015	Drain Plug	2

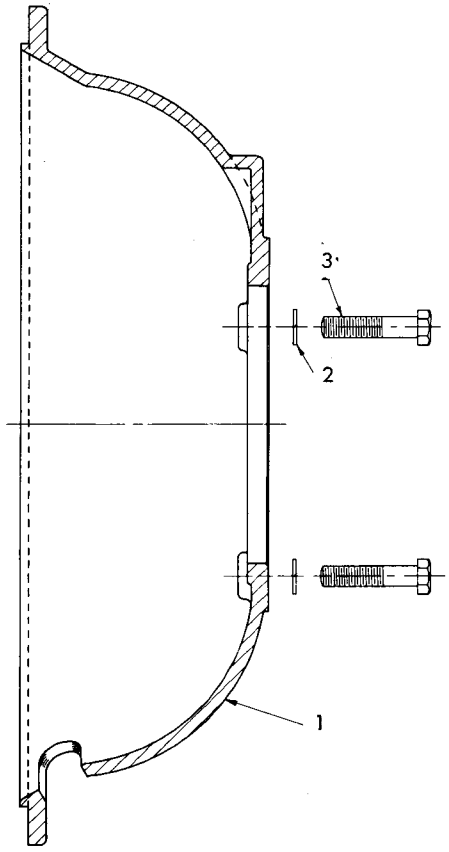
ASSEMBLY NO. 45031

(11¾) Converter Without Drive Ring

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4045013	Race (outer)	1
2	4045010	Sprag (one way clutch)	1
3	4045012	Race (inner)	1
4	4045009	Washer - Stator Thrust	2
5	4045025	Stator Assembly	1
6	4045011	Snap Ring	2
7	4045003	Hub - Impeller	1
8	4045006	Gasket - Hub to Impeller	1
9	4045029	Impeller Assembly	1
10	4045004	Cap Screw	8
11	4045005	Lock Washer	8
12	4045024	Turbine Assembly	1
13	4045016	Washer - Turbine Thrust	1
14	4045026	Cover Assembly - Front	1
15	4045017	"O" Ring Gasket	1
16	4045018	Bolt - Cover to Impeller	10
17	4045019	Lock Nut	10
18	4045015	Drain Plug	2

CONVERTER HOUSING

7500 ASSEMBLY

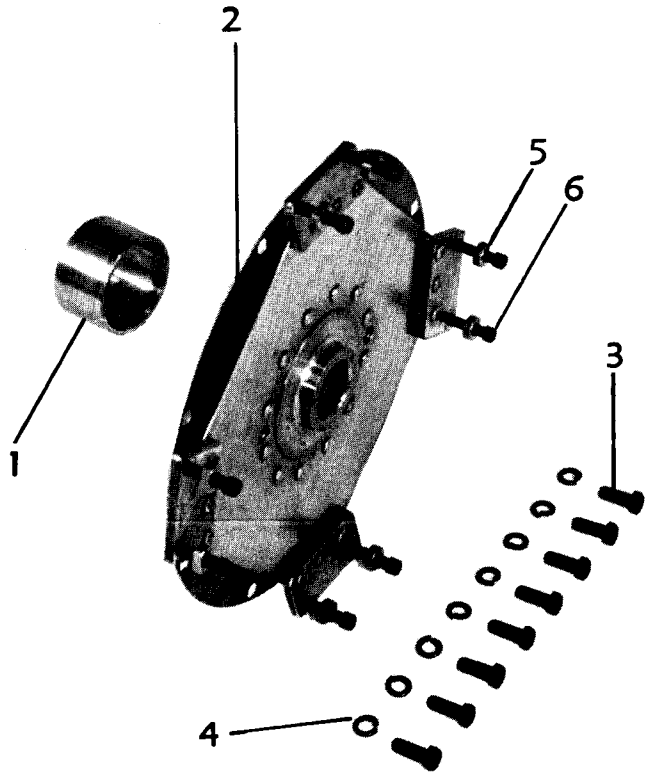


PARTS LIST

Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4TRCA 7501-2 (S.A.E. No. 2) 4TRCA 7501-3 (S.A.E. No. 3) 4TRCC 7501-4 (S.A.E. No. 4)	Converter Housing	1
2	F 16203	Lockwasher, 7/16"	4
3	F 10040-32	Capscrews, 7/16 x 2" NC	4

DRIVE PLATE ASSEMBLIES

PART NO. 4012101 & 4012101-K

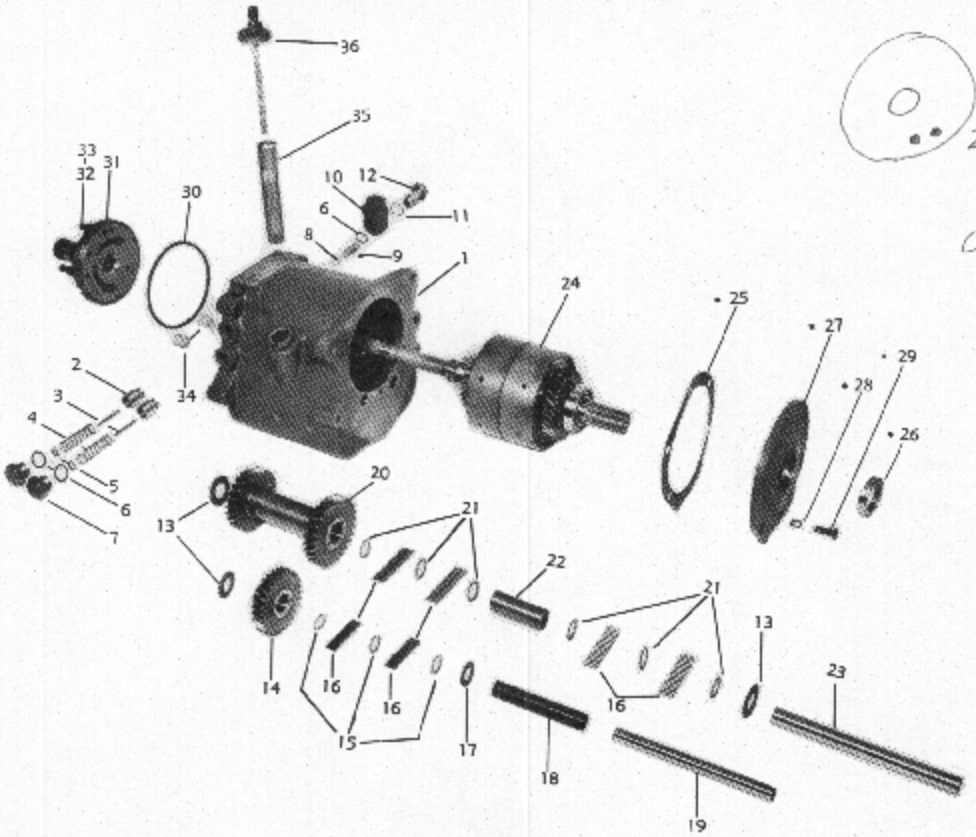


PARTS LIST

Ref. No.	Part No.	DESCRIPTION	No. Reqd.
*1	4012100-1	Sleeve, Drive Hub (1¾ long)	1
2	4012101	Drive plate assembly, converter (for 12" Converter)	1
	4012101-K	Drive plate assembly, converter (for 11¾ Converter	1
3	F 10030-12	Cap screw ⅜-NC x ¾ hex head (HT)	8
4	F 16202	Washer ⅜ Medium spring lock	8
5	4012121	Washer half round 11/16 dia x ¼ thick	8
6	F 11004-20 NY	Cap screw 5/16 NF x 1¼ socket head (HT)	8

*12100-1 sleeve is required to change the standard pilot hub diameter of 2.4395" to 2.8332" pilot hub diameter.

REVERS-O-MATIC DRIVE 40RC-7004



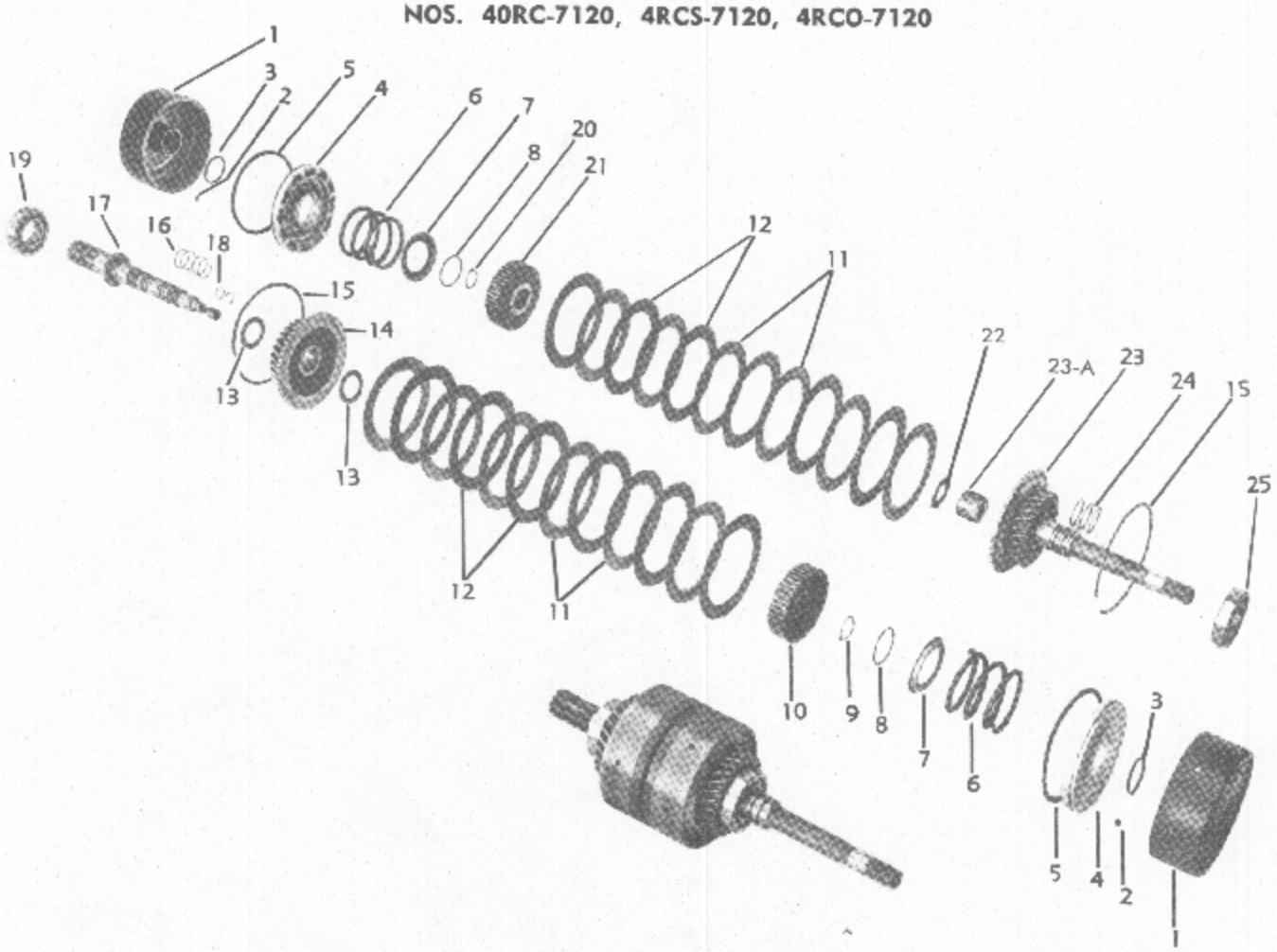
2 non threaded holes clean out w/wire

PARTS LIST

Drawing Ref. No.	Part No.	DESCRIPTION	No. Read.
1	40RC-7799	Case Assembly (left hand)	1 of 2
	40RC-7800	Case Assembly (right hand)	
2	4TRC-7227-C	Valve Regulator, 80/160#	2
3	F 56790	Pin, Regulator Guide	2
4	4TRCB-7223	Spring, Regulator 80/160# 2¼	2
5	F 17030-616	Washer, Pressure Adjusting	As req.
6	F 37020-116	"O" Ring	3
7	4TRC-7225	Cap Reg. Valve	2
8	4TRC-7221	Valve, Regulator, 10#	1
9	4TRCB-7222A	Spring, Regulator Valve 10# (1¾ Long)	1
10	40RC-7666	Block, Reg. Valve	1
11	F 37010-20	"O" Ring - Outer	1
12	4TRC-7232-D	Cap Regulator	1
13	40RC-7798	Washer, Gear Thrust 57/64 x 1¾ x .062	3
14	4TRC-7142G	Gear Idler (24 Teeth)	1
15	4TRCB-7148-2	Washer, Idler Gear Bearing .757 x 1.101 x .067 Spacer	3
16	4TRCB-7148	Roller, Countershaft & Idler Gear Bearing (1815 x 750)	100
17	4TRC-7143-2E	Washer, Idler Gear (.760 x 1.5 x .057)	1
18	4TRC-7143-1E	Tube Spacer, Idler Gear (.772 x .937 x 5.637)	1
19	4TRC-7149B	Shaft, Idler Gear	1
20	4TRCB-7141D	Gear, Counter Shaft (25 and 27 teeth)	1
21	4TRCB-7146-2	Washer	6
22	4TRCB-7146-1	Spacer, Counter Shaft Gear Bearing (.875 x 1.125 x 3.057)	1
23	4TRCB-7147	Shaft, Counter Shaft Gear	1
24	40RC-7120	Clutch Stack Assembly (for Model RC or RCA)	1 of 3
	4RCS-7120	Clutch Stack Assembly (for Model RCS)	
	4RCO-7120	Clutch Stack Assembly (for Model RCO)	
25	4050-154	Gasket, Rear Cover	As Req.
26	F-65003	Seal, Rear Cover	1
27	4050-153	Cover, Rear	1
28	F-18003	Washer (⅜ Sealing)	3
	F-15003	Washer (⅜ External Star)	X2 X5
29	F-10030-16	Cap Screw (⅜ x 1) N.C. Hex	
30	4TRC-7009	Gasket, Oil Pump	1
31	40RC-7702	Pump Assembly Oil	1 of 2
	4000583	Pump Assembly Oil (for Model RCS)	
31-A	F-65037	Oil Seal NATL. 450138	
		Ref. #31-A Serviceable Part of Pump	
32	F-10020128	Cap Screw (5/16 x 1¾" N.C. Hex)	2 remove
	F-10020-32		
33	F-18002	Cap Screw (5/16 x 2" N.C. Hex)	2
33	F-18002	Washer (5/6 Sealing)	4
34	F-87107	Cork (¾")	2
35	4TRC-7105	Screen, Oil Strainer	1
36	4TRC-7104	Filler Cap and Oil Level Gauge Assembly	1

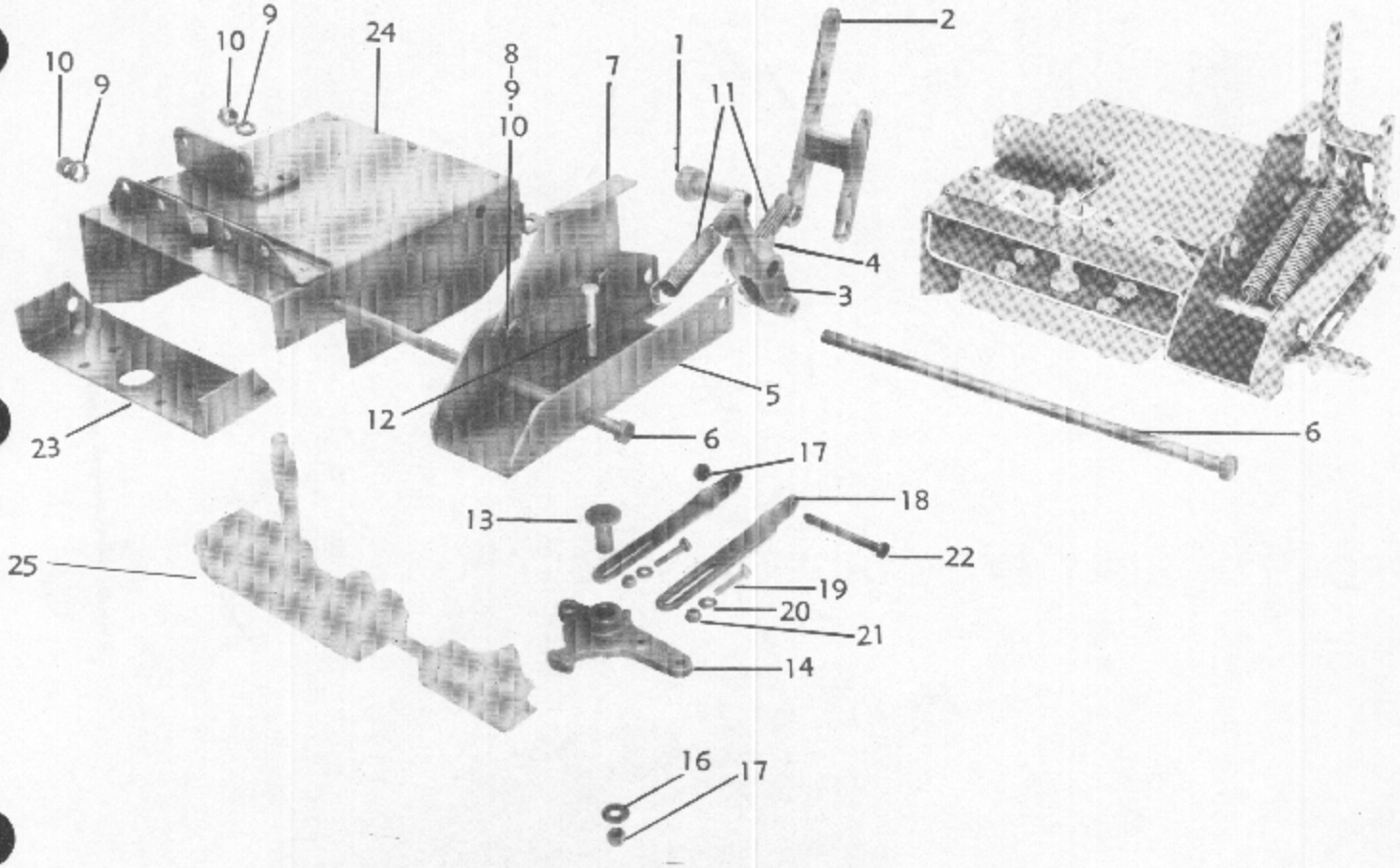
CLUTCH STACK ASSEMBLIES

NOS. 40RC-7120, 4RCS-7120, 4RCO-7120



Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	40RC-7160	Cylinder Assembly Clutch	2
2	F 74000-8D	Ball ¼	2
3	F 37030-222	"O" Ring, Piston, Inner	2
4	40RC-7165B	Piston, Clutch	2
5	40RC-7167	Seal, Piston, Outer	2
6	40RC-7169	Spring, Clutch	2
7	40RC-7631	Retainer, Clutch Spring	2
8	F 80500-175	Ring, Snap	2
9	F 39010-106	Ring, Snap Rear Clutch Hub	1
10	40RC-7155	Hub, Clutch Rear	1
11	4TRC-7174	Plate, Clutch Int. Spline	12
12	40RC-7727	Plate Separator, Ext. Spline	12
13	4TRC-7175	Washer, Thrust, Output Gear (1-17/64 x 1-27/32 x .062)	2
14	4TRC-7140-C	Gear Ass'y. Power Output	1
15	4TRC-7171	Ring, Snap (Clutch Stack Retainer)	2
16	4TRC-7159-A	Ring, Seal (1.063 x .093)	4
17	4TRC-7151-2	Shaft Ass'y., Power Output (for Model RC or RCS)	1 of 2
	4TRCO-7151-2	(For Model RCO)	
18	4TRC-7154	Ring Seal (.625 x .093)	2
19	F 41207	Bearing, Ball, Output Shaft	1
20	F 39010-102	Ring, Snap, Front Clutch Hub	1
21	40RC-7156	Hub, Clutch Front	1
22	40RC-7798	Washer, Gear Thrust (57/64 x 1-3/4 x .062)	1
23	40RC-7719	Shaft Assembly Power Input (for Model RC & RCO) 17 Tooth Spline	1
	40RC-7720	Shaft Assembly Power Input (for Model RCS) 29 Tooth Spline	1
23-A	F 52071-73	Bearing, Pilot	1
24	4TRC-7136-A	Ring, Seal (1.376 x .093)	3
25	F 41207	Bearing, Ball, Input Shaft	1

TRCB-7250 CONTROL ASSEMBLY



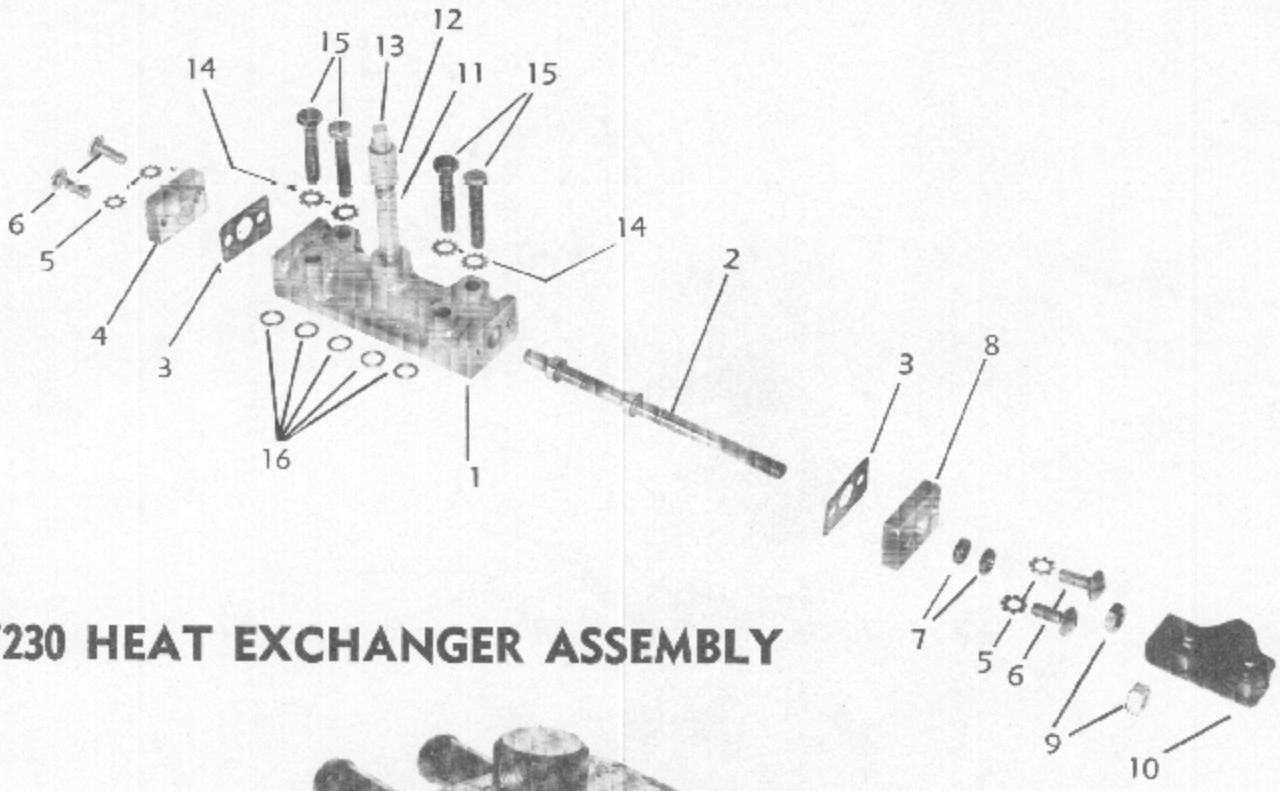
(LEFT HAND ASSEMBLY SHOWN)

PARTS LIST

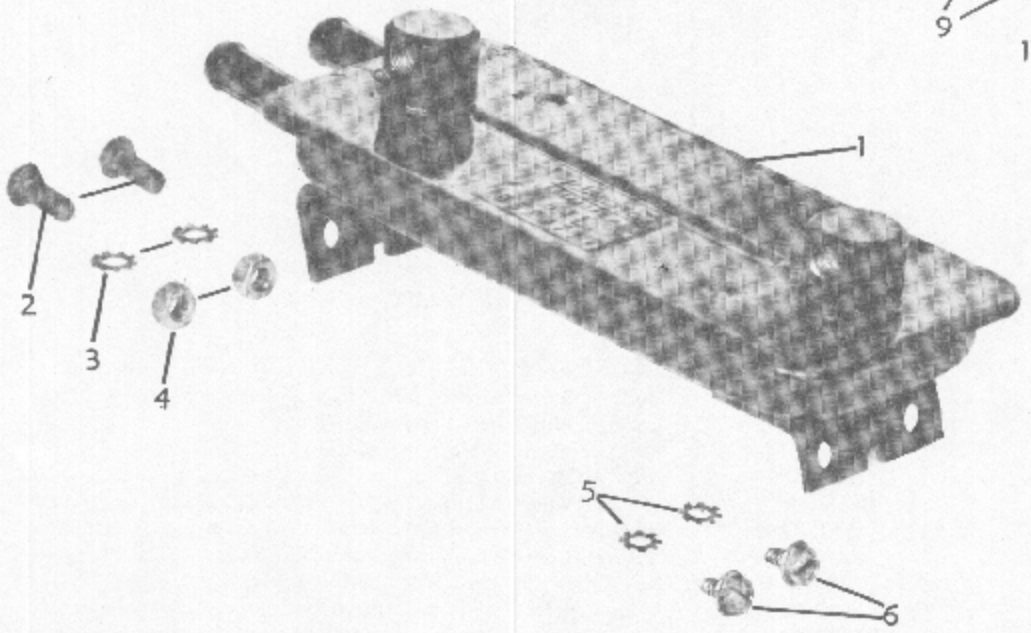
Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4TRC-7272	Bushing, Lever to Rocker	1
*2	4TRCB-7278 LH	Lever, Throttle (left hand control)	1 of 2
	4TRCB-7278 RH	Lever, Throttle (right hand control)	
3	4TRCB-7271	Rocker, Throttle	1
4	F 66010	Grease Fitting	2
*5	4TRC-7268 LH	Bracket, Control (left hand control)	1 of 2
	42RC-7268 RH	Bracket, Control (right hand control)	
6	F 10030-192	Bolt (3/8 x 12 N. C. Machine Head)	2
*7	4TRCB-7277 LH	Stop, Control (left hand control)	1 of 2
	4TRCB-7277 RH	Stop, Control (right hand control)	
8	F 10030-16	Bolt (3/8 x 1 NC Hex.)	2
9	F 16202	Washer (3/8 Lock)	4
10	F 13005	Nut (3/8 NC Hex.)	4
11	4TRCB-7279	Spring, Throttle Lever	2
12	F 10201-16	Bolt (1/4 x 1-3/4 NF Hex.)	1
13	4TRC-7262	Bushing, Bellcrank	1
14	4TRC-7261	Bellcrank	1
15	F 17001-N	Washer (1/4 Std. Flat)	1
16	F 17000-36	Washer (3/16 Std. Flat)	1
17	F 78125-28	Nut (1/4" NF Hex. Fibrelock)	2
18	4TRC-7263	Link, Bellcrank to Rocker	2
19	F 10200-10	Bolt (#10-32 x 1 Hex.)	2
20	F 17000-36	Washer (#10 Flat)	2
21	F 78110-32	Nut (#10-32 Hex. Fibrelock)	2
22	F 10201-25	Bolt (1/4 x 2-5/8 N.F. Hex.)	1
23	4TRC-7269	Base	1
24	40RC-7267 LH	Air Scoop (per spec.) L.H.	1 of 2
	40RC-7267 RH	Air Scoop (per spec.) R.H.	
25 (Ref)	4TRC-7200	Control Valve Assembly	1

*Part Must Be Ordered For Left or Right Hand Control.

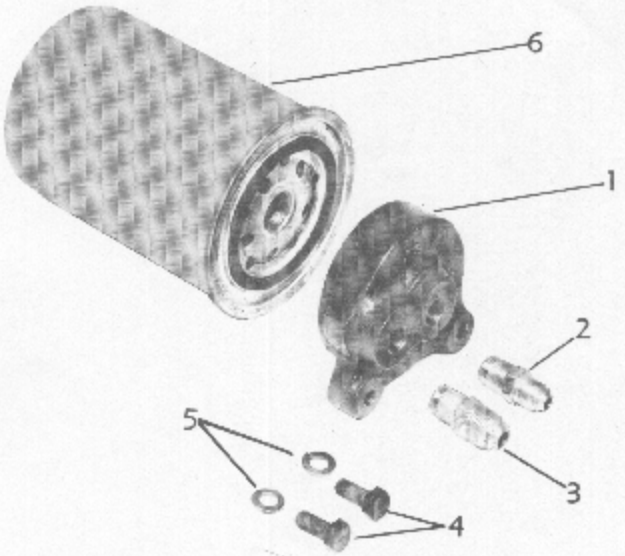
4TRC 7200 CONTROL VALVE ASSEMBLY

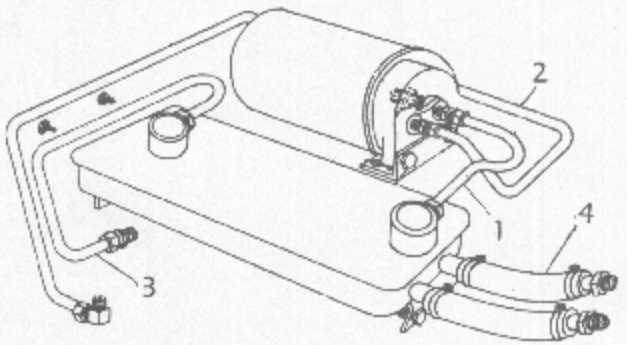


4TRCA 7230 HEAT EXCHANGER ASSEMBLY



4TRC 7240 OIL FILTER ASSEMBLY





4TRC 7200 CONTROL VALVE ASSEMBLY

PARTS LIST

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4TRC 7202	Body Valve	1
2	4TRC 7201	Valve, Control	1
3	4TRC 7205	Gaskets, Valve Caps	2
4	4TRC 7203	Cap, Valve, Closed	1
5	F 15001	Washer (1/4" Ext. Star)	4
6	F 77867-24	Cap Screw (1/4 x 3/4" NC. Rd. Sltd. Hd.)	4
7	F 65133	Seal, Oil	2
8	4TRC 7204	Cap, Valve, Open (Takes Oil Seal)	1
9	F 79103	Nut (5/16" NF, Hex., Thin Jam)	2
10	4000488	Roller Cage Assy.	1
11	F 32610-16	Nipple, Pipe (1/8 x 2")	1
12	F 37020-2	Coupling (1/8" Pipe)	1
13	F 19001-2	Plug (1/8" Pipe, Sq. Hd.)	1
14	F 15002	Washer (5/16" Ext. Star)	4
15	F 10020-24	Cap Screw (5/16 x 1 1/2" NC. Hex.)	4
16	F 37010-012	"O" Ring	5

4TRCA 7230 HEAT EXCHANGER ASSEMBLY

PARTS LIST

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	4TRCA-7236	Heat Exchanger (Oil Cooler)	1
2	F 10020-12	Bolt (5/16 x 3/4 N.C. Hex Head)	2
3	F 16201	Washer (5/16 Lock)	2
4	F 13003	Nut (5/16 N.C. Hex. Head)	2
5	F 15001	Washer (1/4 Ext. Star)	2
6	F 86104-6	Screw, Self Tapping (1/4 x 3/8) Hex. Head	2

4TRC 7240 OIL FILTER ASSEMBLY

PARTS LIST

1	40RC 7607	Filter Cap Ass'y.	1
2	TRC 7245	Fitting (5/16 x 1/4) Per Spec.	1
3		Fitting (3/8 x 1/4) Per Spec.	1
4	F 10020-12	Cap Screw 5/16 x 3/4 (N.C.)	2
5	F 16201	Washer 5/16 Lock	2
6	4TRC 7244	Oil Filter (AC Type PF-2 Cartridge)	1

Drawing Ref. No.	Part No.	DESCRIPTION	No. Reqd.
1	7246	Tube 5/16 Copper (heat exchanger to oil filter)	per spec.
2	7234	Tube 5/16 Copper (Regulator block to oil filter)	per spec.
3	7233	Tube 5/16 Copper (heat Exchanger to Case)	per spec.
4		Hose (5/8 ID) This Item is shown for reference only and is not supplied by the Funk Mfg. Co.	

NOTE:

Model No. & Specification No. MUST ALWAYS Be Shown When Ordering Tubes.