

PRO-SHIFT STD PS150-16 TRANSMISSION PARTS CATALOG



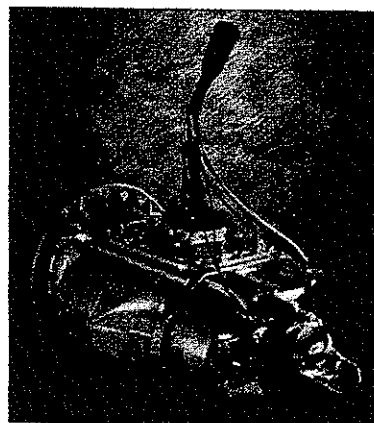
Bulletin No. T210-PSO-16

Revised June 1999



Technology in Motion®

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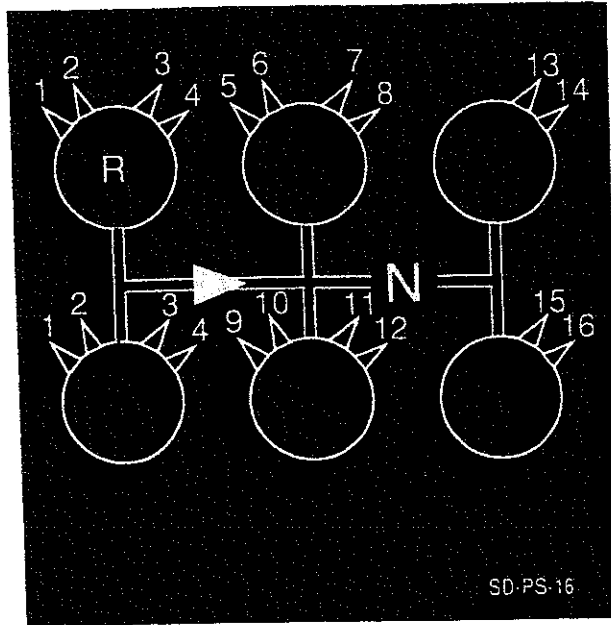
When ordering parts ensure that correct model is identified, as externally these transmissions are identical. An identification plate is affixed to the rear case between the two air cylinders.

When requesting any information furnish Serial number, B/M number and Model.

MODEL PSO-16

Ratio Table

HDPS-1620-0599

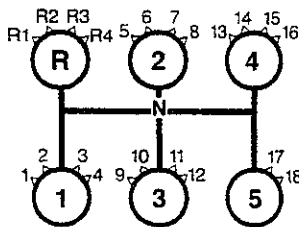


MODEL PSO-16				
SPEEDS	MODELS			
	PSO150-16A	PSO150-16B	PSO165-16B	PSO175-16B
1st	12.83	14.52	14.52	14.52
2nd	10.81	11.97	11.97	11.97
3rd	8.86	9.96	9.96	9.96
4th	7.47	8.21	8.21	8.21
5th	6.25	6.81	6.81	6.81
6th	5.26	5.61	5.61	5.61
7th	4.31	4.67	4.67	4.67
8th	3.63	3.85	3.85	3.85
9th	3.01	3.15	3.15	3.15
10th	2.53	2.60	2.60	2.60
11th	2.08	2.16	2.16	2.16
12th	1.75	1.78	1.78	1.78
13th	1.44	1.46	1.46	1.46
14th	1.22	1.20	1.20	1.20
15th	1.00	1.00	1.00	1.00
16th	.84	.82	.82	.82
R1	12.83	14.52	14.52	14.52
R2	10.81	11.97	11.97	11.97
R3	8.86	9.96	9.96	9.96
R4	7.47	8.21	8.21	8.21

SHIFTING THE SPICER 16 SPEED TRANSMISSION DRIVER INSTRUCTIONS

The 18 speed was designed to be used with performance engines (1800-2100 RPM governed and 1200 RPM peak torque) for performance, on/off highway and specialty hauling applications. It is a close stepped (18-19%) transmission with maximum versatility and driver ease. The air system provides the muscle to shift the splitter and range sections. All 18 gears are obtained from a single lever with a standard shift pattern. The gear ratios and shift pattern are shown below.

Shift Pattern:



Ratio

Rev	14.21			
	11.97			
	10.13			
	8.53			
1	14.21			
		19%		
2	11.97			
		18%		
3	10.13			
		19%		
4	8.53			
		14%		
5	7.46			
		19%		
6	6.28			
		18%		
7	5.32			
		19%		
8	4.48			
		15%		
9	3.89			
		19%		
			10	3.27
				18%
			11	2.77
				19%
			12	2.33
				19%
			13	1.96
				19%
			14	1.65
				19%
			15	1.40
				19%
			16	1.18
				18%
			17	1.00
				19%
			18	.84

As professionals you know clash-free shifts are made when engine speed and driveline speeds are matched. We recommend double clutching when the shift lever is changed either up or down in shift sequence.

Clutch Brake

The clutch brake used with this unit is designed for stopping gears to get into 1st and reverse. The last one inch of clutch pedal travel activates the clutch brake. So on shifts other than first or reverse from a stop, only depress the clutch pedal enough to release the clutch. Depressing the pedal to the floorboard will activate the clutch brake and could cause gear hang up or hard shifting.

When starting if you have a butt tooth condition, gradually release clutch. The drive gear can then roll over to align teeth to complete the shift.

Upshifting

Normal shift sequence is shown on the shift pattern. When the lever is moved use the normal double clutch technique. When the shift is desired, depress the clutch moving the lever to neutral.

Engage the clutch allowing the engine to drop (300-350 rpm) so engine and driveline speed are matched. Depress the clutch and move lever into gear. Engage clutch and accelerate as conditions permit.

On splitter shifts (1 → 4, 5 → 8, 9 → 12, 13 → 16, and 17 → 18), don't move the lever from its position. With torque on the driveline, merely select the air control and use a single clutch

application just to break torque, let the engine speed drop (300-350 rpm). Engage the clutch and apply the throttle. The shift from the 2nd to 3rd air position on the control is a double shift. Both the splitter and range are shifting, so it will take the shift slightly longer.

When the shift requires both splitter and lever position change (4 → 5, 8 → 9, 12 → 13, and 16 → 17), select the splitter just as the shift lever enters neutral. Complete a normal double clutch operation. The air shift will be completed automatically as the lever is moved to the next gear position.

Downshifting

On a splitter shift, don't move the lever. With torque on the driveline, select the splitter, break torque with a single clutch application while simultaneously increasing engine speed toward the governor. The air system will complete the downshift quickly and smoothly. When the lever movement is required, the double clutch technique is used. As the engine approaches the shift point (start the downshift 50-100 rpm above the shift point) select the splitter with torque on the driveline, depress the clutch and move the lever to neutral. Engage the clutch and raise the engine (275-325 rpm) until the engine RPM and driveline speed are equal. Depress the clutch and move the shift lever into the next lower gear. Engage the clutch and keep on trucking!

For further assistance, contact your local truck dealer or call:

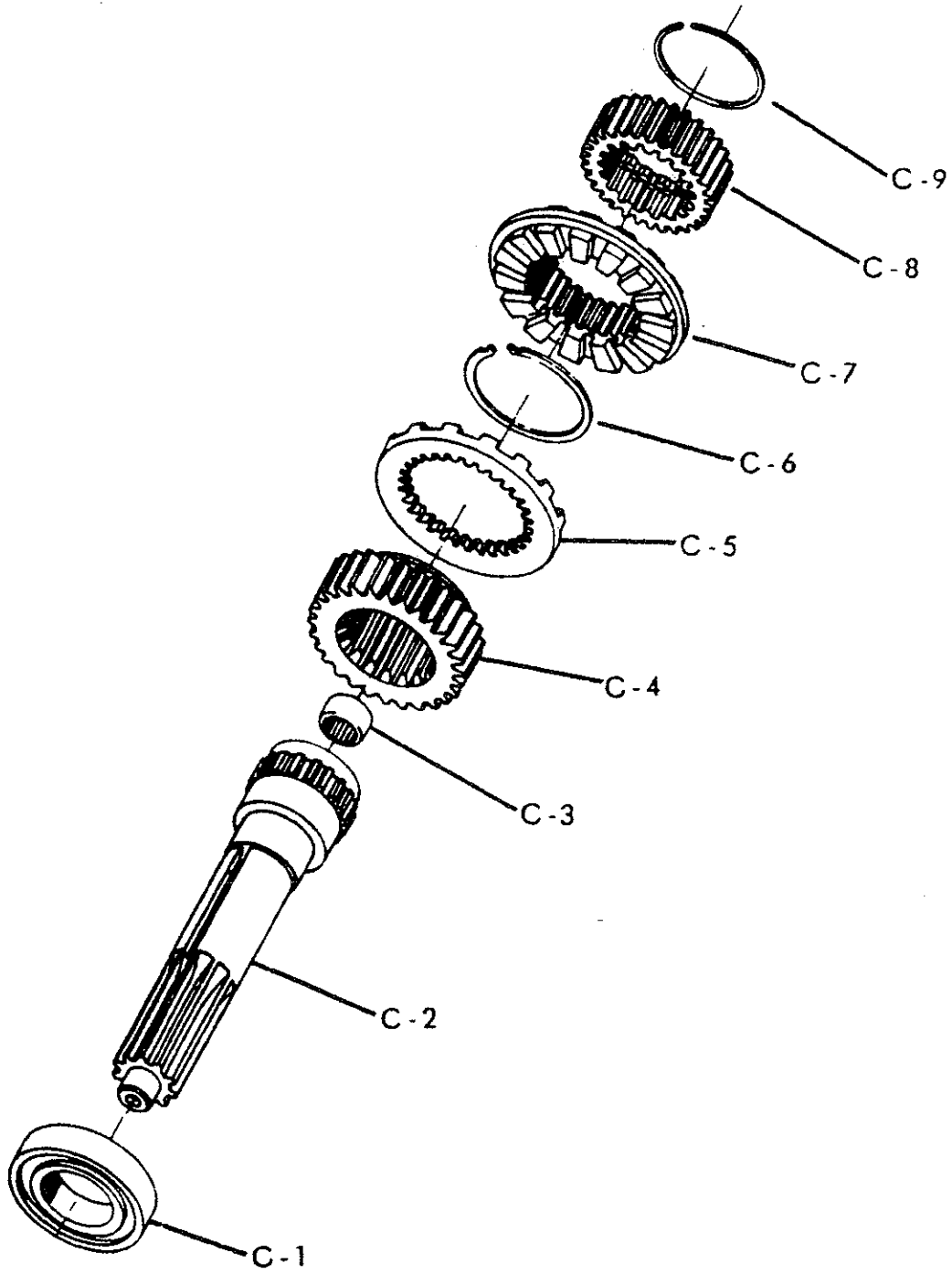
Transmission Technologies Corporation
P.O. Box 986
Toledo, OH 43697-0986
1-800-401-9866



MODEL PSO-16

Drive Gear Group and Mainshaft Group

HDPS-1620-0599



MODEL PSO-16

Drive Gear Group and Mainshaft Group

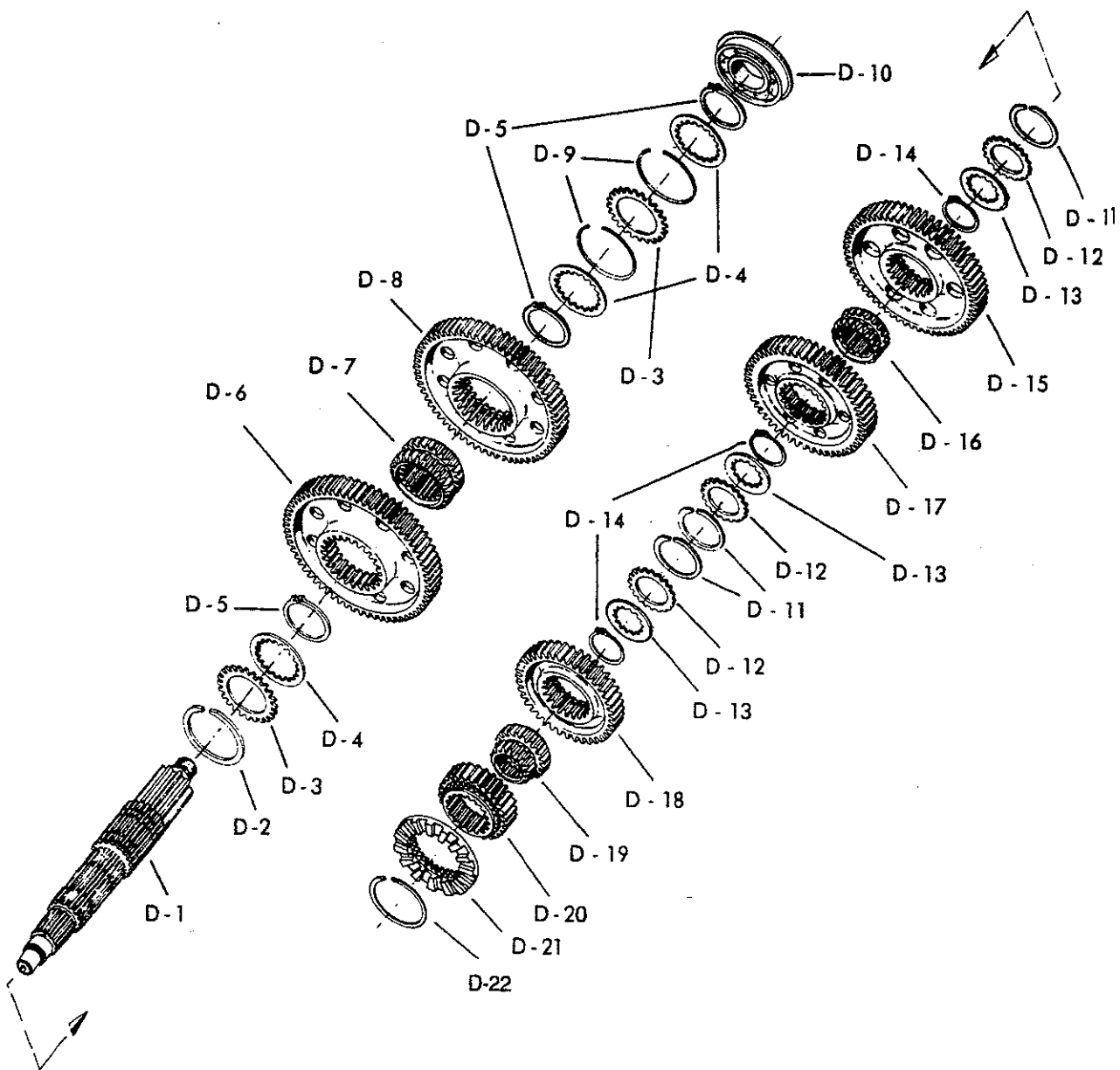
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
DRIVE GEAR INPUT SHAFT GROUP			
C-1	550944	Bearing.....	1
C-2	97-35-34	Drive Gear Input Shaft - 2" - 10 Spline.....	1
C-3	550889	Pocket Bearing.....	1
C-4		Drive Gear.....	1
	97-35-39	(28T) - for PSO150-16A	
	97-35-112	(26T) - for PSO165-16B & PSO175-16B	
	97-35-209	(26T) - for PSO150-16B	
C-5	97-466-13	Clutch Ring - drive gear and splitter.....	1
C-6	97-381-31	Snap Ring.....	1
C-7	97-456-26	Clutch Collar - Splitter.....	1
C-8	97-466-17	Clutch Splitter Gear.....	1
C-9	97-381-2	Snap Ring.....	1

MODEL PSO-16

HDPS-1620-0599

Drive Gear Group and Mainshaft Group



MODEL PSO-16

Drive Gear Group and Mainshaft Group

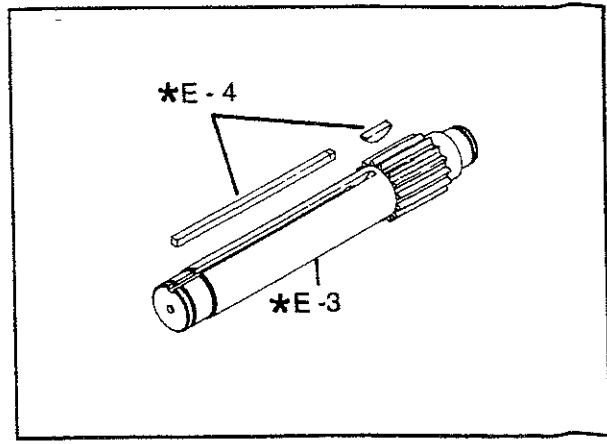
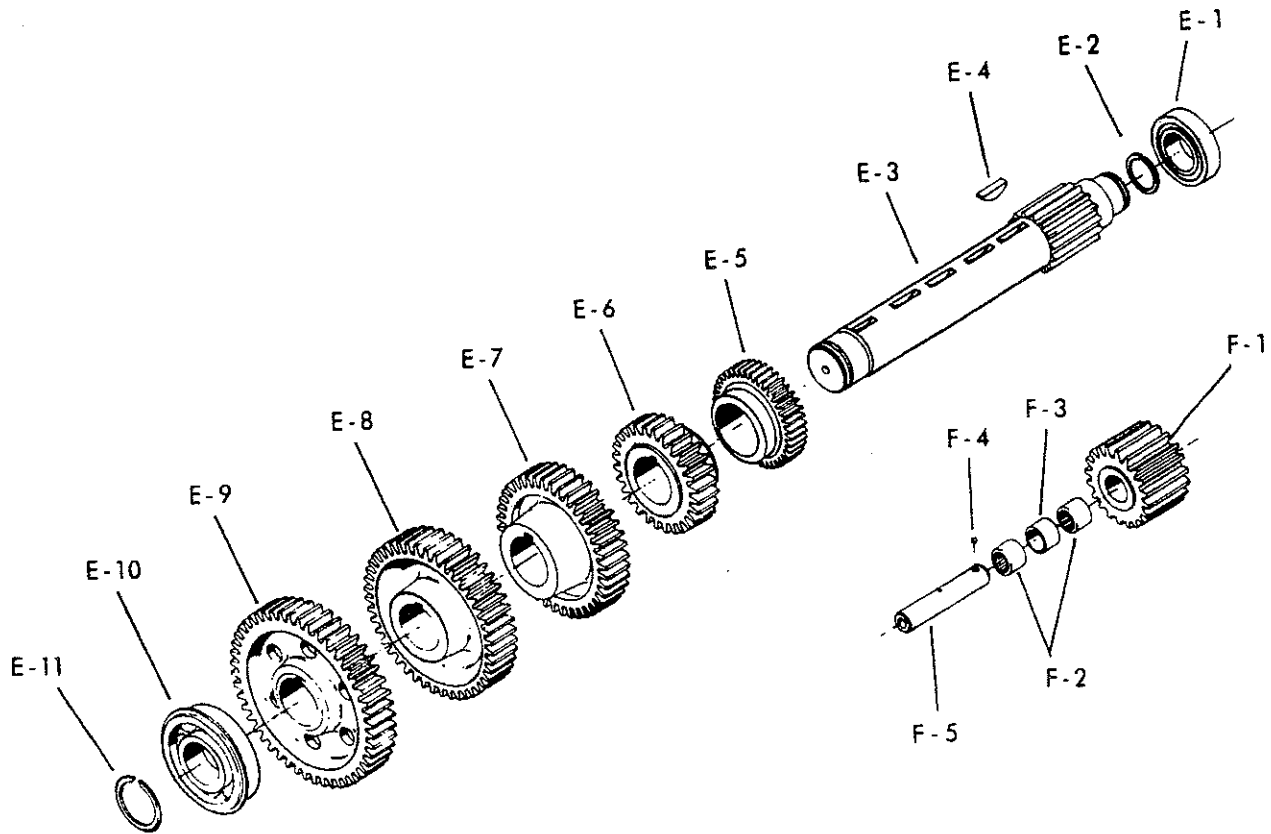
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
MAINSHAFT GROUP			
D-1	97-362-51	Mainshaft.....	1
D-2	98-381-2	Snap Ring.....	1
D-3	330810	Thrust Washer - external (24T).....	2
D-4	330869	Thrust Washer - internal (18T).....	3
D-5	98-381-1	Snap Ring.....	3
D-6	97-8-113	Mainshaft Gear (64T) - 1st - 4th gear.....	1
D-7	97-465-24	Clutch Collar - (1st - 4th and Reverse).....	1
D-8	97-8-182	Shift Gear (64T) - Reverse.....	1
D-9	97-381-32	Snap Ring.....	2
D-10	550925	Bearing - rear.....	1
D-11	97-381-1	Snap Ring.....	3
D-12	330814	Thrust Washer - external (20T).....	3
D-13	330730	Thrust Washer - internal (15T).....	3
D-14	97-381-4	Snap Ring.....	3
D-15		Mainshaft Gear - 5th - 8th.....	1
	97-8-305	(54T) - for PSO150-16A	
	97-8-325	(52T) - for PSO150-16B / PSO165-16B / PSO175-16B	
D-16	97-465-21	Clutch Collar - (5th - 12th).....	1
D-17		Mainshaft Gear - 9th - 12th.....	1
	97-8-303	(40T) - for PSO150-16A	
	97-8-327	(38T) - for PSO150-16B / PSO165-16B / PSO175-16B	
D-18		Mainshaft Gear - 13th - 14th.....	1
	97-8-301	(32T) - for PSO150-16A	
	97-8-329	(30T) - for PSO150-16B / PSO165-16B / PSO175-16B	
D-19	97-465-50	Clutch Collar - (13th - 16th).....	1
D-20		Mainshaft Gear - 15th - 16th.....	1
	97-35-36	(26T) - for PSO150-16A	
	97-35-114	(24T) - for PSO165-16B / PSO175-16B	
	97-35-207	(24T) - for PSO150-16B	
D-21	97-466-13	Clutch Ring - drive gear and splitter.....	1
D-22	97-381-31	Snap Ring.....	1

MODEL PSO-16

HDPS-1620-0599

Countershaft Group and Idler Gear Group



MODEL PSO-16

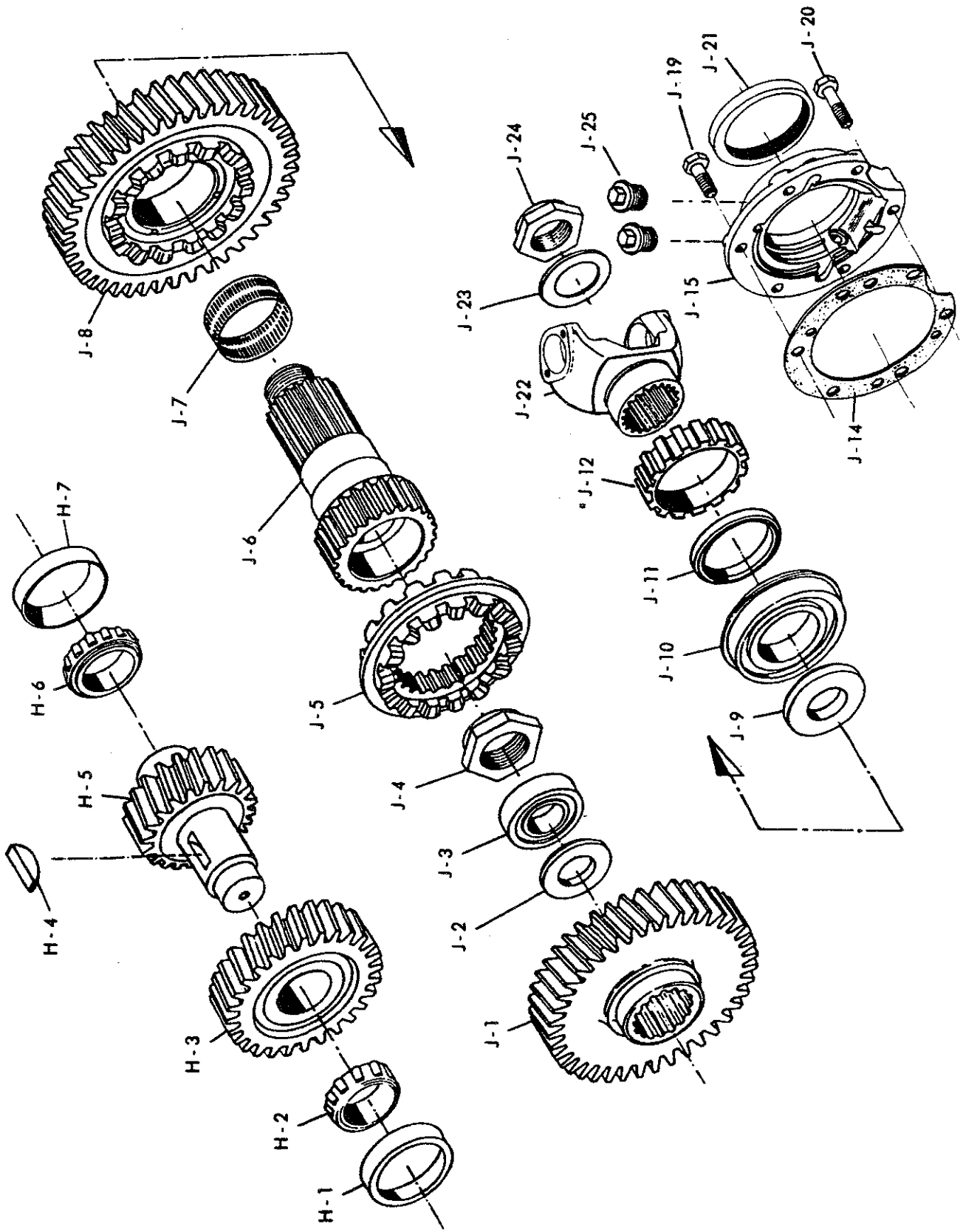
Countershaft Group and Idler Gear Group

HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
Countershaft Group			
E-1	550969	Bearing - rear.....	2
E-2	97-381-34	Snap Ring - for rear bearing.....	2
E-3A		Countershaft Assembly.....	2
	97-30-46-1X	(includes E-3, E-4 and E-11)	
	97-30-77-1X	(includes E-3, E-4 and E-11)	
E-3		Countershaft.....	2
	97-30-46	Shaft - for PSO150-16A & PSO150-16B	
	* 97-30-77	Shaft - for PSO165-16B & PSO175-16B	
E-4	500010-8	Woodruff Key (use with 97-30-46).....	10
		Use with 97-30-77	
	* 98-210-2	Woodruff Key (Long).....	2
	* 500010-8	Woodruff Key (Short).....	2
E-5		Countershaft Gear - 5th - 8th.....	2
	97-196-355	(26T) - for PSO150-16A	
	97-196-375	(26T) - for PSO150-16B / PSO165-16B / PSO175-16B	
E-6		Countershaft Gear - 9th - 12th.....	2
	97-196-353	(40T) - for PSO150-16A	
	97-196-377	(41T) - for PSO150-16B / PSO165-16B / PSO175-16B	
E-7		Countershaft Gear - 13th - 14th.....	2
	97-196-351	(46T) - for PSO150-16A	
	97-196-379	(48T) - for PSO150-16B / PSO165-16B / PSO175-16B	
E-8		Countershaft Low Gear - 15th - 16th.....	2
	97-196-53	(54T) - for PSO150-16A	
	97-196-177	(56T) - for PSO165-16B / PSO175-16B	
	97-196-381	(56T) - for PSO150-16B	
E-9		Countershaft High Gear.....	2
	97-1-21	(49T) - for PSO150-16A	
	97-1-59	(50T) - for PSO165-16B / PSO175-16B	
	97-1-90	(50T) - for PSO150-16B	
E-10		Bearing - Front (Either Part Can Be Used For All Models).....	2
	97-482-2		
	550952		
E-11	97-381-30	Snap Ring.....	2
IDLER GEAR GROUP			
F-1	97-5-1	Gear- reverse idler (21T).....	2
F-2	550886	Bearing - for idler gear.....	4
F-3	97-37-1	Spacer - for idler gear bearings.....	2
F-4	500566-8	Lockball - 9/32" diameter.....	2
F-5	97-60-1	Shaft - for reverse idler gear.....	2

MODEL PSO-16

HDPS-1620-0599 Auxiliary Countershaft Group and Output Shaft Group



MODEL PSO-16

Auxiliary Countershaft Group and Output Shaft Group

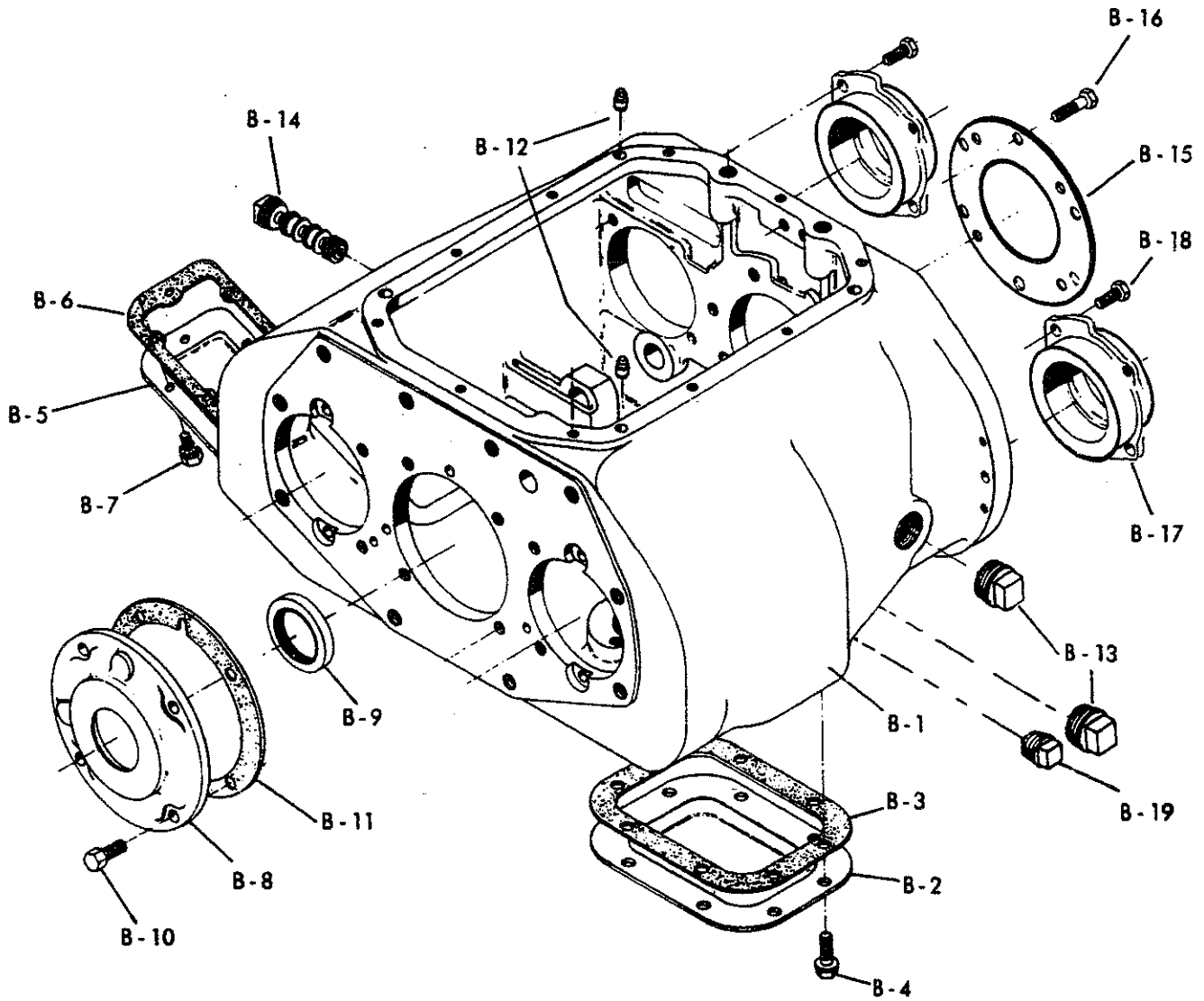
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
Auxiliary Countershaft Group			
H-1	550899	Bearing - countershaft front taper cup.....	2
H-2	550900	Bearing - countershaft front taper cone.....	2
H-3		Gear - head end countershaft.....	2
	97-1-33	(31T / 5P) for PSO150-16B	
	97-1-61	(31T / 5P) for PSO165-16B & PSO175-16B	
	97-1-84	(32T / 5P) for PSO150-16A	
H-4	500010-18	Key - countershaft gear.....	2
H-5		Auxiliary Countershaft.....	2
	97-30-57	(26T) - slotted for pump - PSO150-16A	
	97-30-82	(25T) - slotted for pump - PSO165-16B & PSO175-16B	
	97-30-90	(25T) - slotted for pump - PSO150-16B	
H-6	550936	Bearing - countershaft rear taper cone.....	2
H-7	550935	Bearing - countershaft rear taper cup.....	2
Output Shaft Group			
J-1		Gear - auxiliary drive gear.....	1
	97-8-59	(34T / 5P) - PSO150-16A & PSO150-16B	
	97-8-248	(34T / 5P) - PSO165-16B & PSO175-16B	
J-2	97-47-3	Washer - auxiliary mainshaft bearing thrust.....	1
J-3	550921	Bearing	1
J-4	545006	Nut.....	1
J-5	97-465-27	Collar for output shaft.....	1
J-6	97-362-59	Mainshaft (auxiliary output).....	1
J-7	550932	Needle Bearing - for mainshaft output gear.....	1
J-8		Gear - low mainshaft.....	1
	97-8-220	(40T / 5P) - PSO150-16A & PSO150-16B	
	97-8-249	(40T / 5P) - PSO165-16B & PSO175-16B	
J-9	97-47-4	Washer - auxiliary mainshaft bearing thrust.....	1
J-10	550925	Bearing.....	1
J-11	97-37-17	Speedometer gear spacer (used with 97-452-14 & 97-37-7)	1
J-12	See Tab Bills	Speedometer Ring Gear.....	1
	97-452-22	Electronic Speedometer Ring Gear with Hub	
	97-452-14	Electronic Speedometer Ring Gear (use with 97-37-17)	
	97-37-7	Used when there is NOT a speedometer with 97-37-17	
	55-334-1	Plug - (used without speedometer driven gear).....	1
J-13	60-475-1	Bushing - mainshaft rear bearing cap speedometer.....	1
J-14	97-223-2	Gasket - mainshaft rear bearing cap.....	1
J-15	See Tab Bills	Cap - electronic rear bearing with cruise outlet.....	1
J-19	545001-4	Bolt - 1/2" - 13 x 1 1/2" hex head self locking.....	4
J-20	545001-8	Bolt - 1/2" - 13 x 2 1/2" hex head self locking.....	2
J-21	97-463-33	Seal - mainshaft rear bearing cap oil seal.....	1
J-22	See Tab Bills	Yoke.....	1
J-23	330734	Washer - for output shaft nut.....	1
J-24	545065	Nut - for output shaft.....	1
J-25	545021	Plug	2

MODEL PSO-16

Main Case Group

HDPS-1620-0599



MODEL PSO-16

Main Case Group

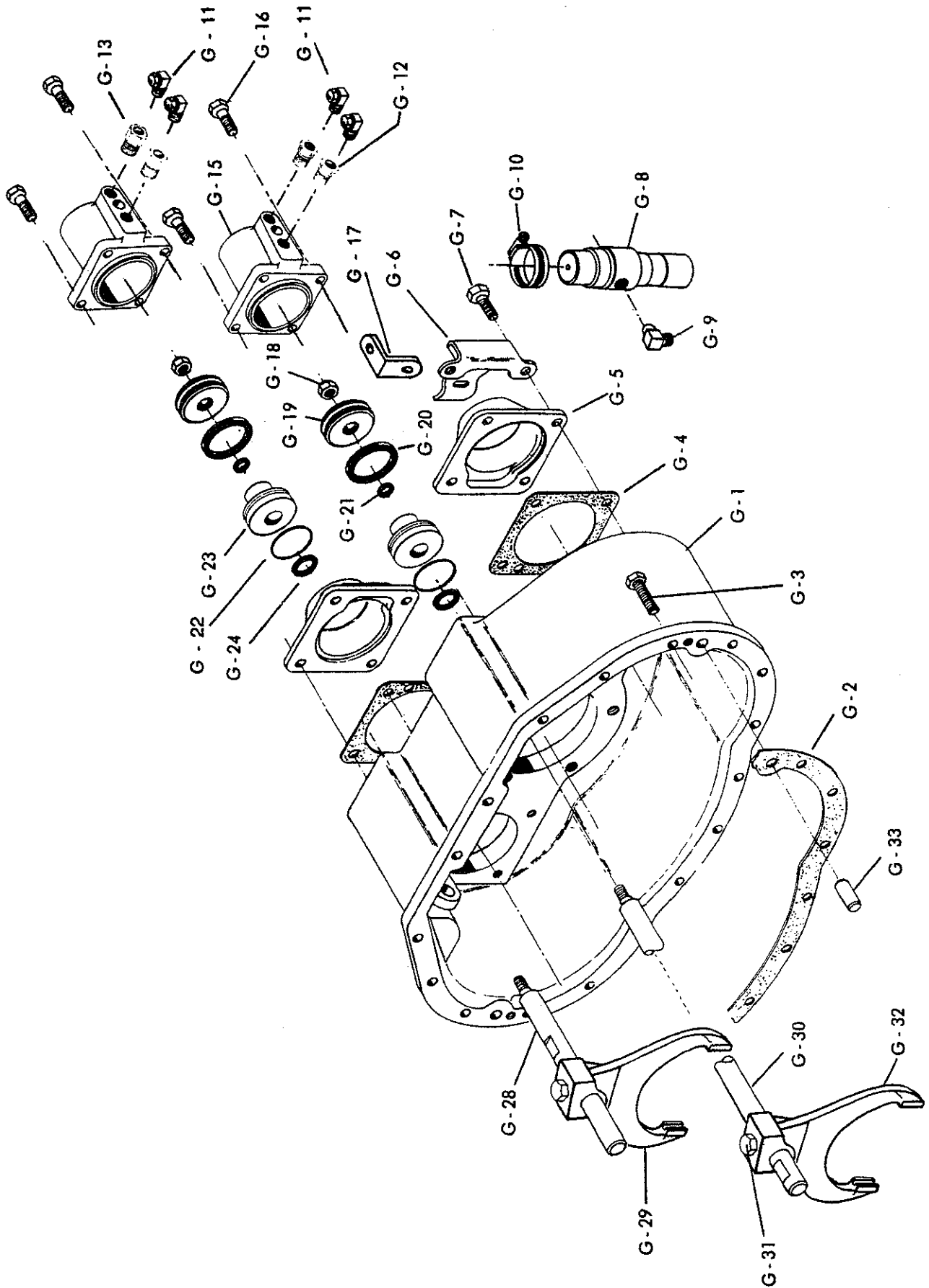
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
B-1	See Tab Bills 97-15-61-1X	Case Assembly.....	1
		Case Assembly (97-15-90-1X can be used in place of 97-15-61-1X for service)	
	97-15-90-1X	Case Assembly (97-15-90-1X will service 97-15-61-1X also)	
B-2	73-267-1	Cover - P.T.O. Aperture (8 Hole).....	1
B-3	97-324-2	Gasket - P.T.O. Aperture (8 Hole).....	1
B-4	545012	Bolt - 7/16" - 14 x 3/4" flanged head self locking.....	8
B-5	50-267-2	Cover - P.T.O. Aperture (6 Hole).....	1
B-6	97-324-1	Gasket - P.T.O. Aperture (6 Hole).....	1
B-7	330800	Bolt - 3/8" - 16 x 3/4" flanged head self locking.....	6
B-8	97-19-36-1X	Bearing Cap and Oil Seal Assembly (B-8 & B9).....	1
B-9	97-463-32	Oil Seal.....	1
B-10	545002-4	Bolt - 3/8" - 16 x 1 1/8" hex head self locking.....	4
B-11	97-223-1	Gasket for Bearing Cap.....	1
B-12	274-SP	Dowel Pin - locator for shifter housing.....	2
B-13	62-39-3	Drain and Filler Plug - magnetic.....	2
B-14	97-39-1	Drain Plug - magnetic.....	1
B-15	97-360-8	Mainshaft Rear Bearing Retainer.....	1
B-16	545001-5	Bolt - 1/2" - 13 x 1 1/4" flanged head self locking	
		For use with 97-15-61-1X.....	6
		For use with 97-15-90-1X.....	5
B-17	97-360-6	Countershaft Rear Bearing Retainer.....	2
B-18	545002	Bolt - 3/8" - 16 x 1" hex head self locking.....	4
B-19	500114	Plug - temperature indicator hole.....	1

MODEL PSO-16

HDP5-1620-0599

Rear Case, Bearing Cap and Pneumatic Parts



MODEL PSO-16

Rear Case, Bearing Cap and Pneumatic Parts

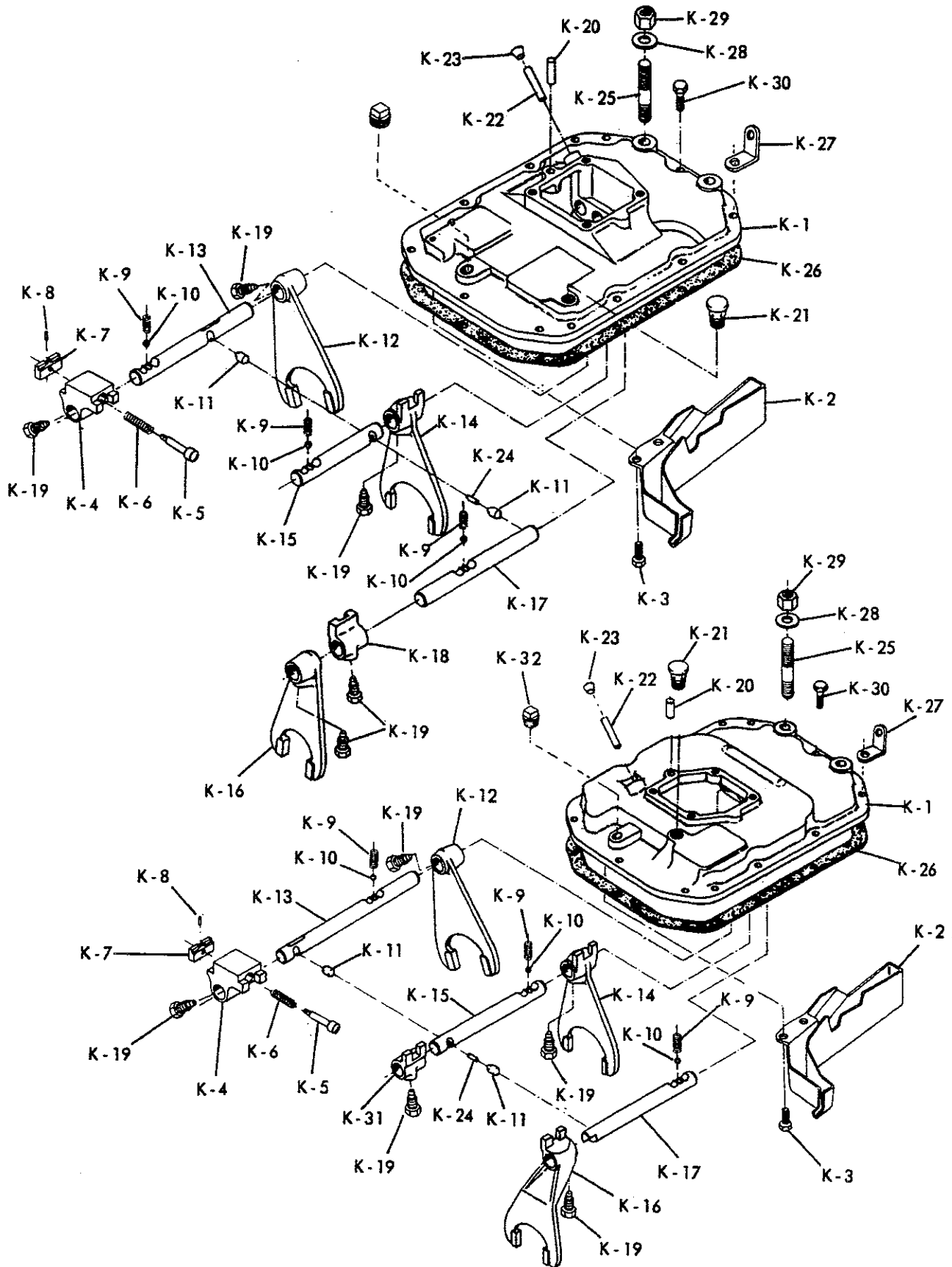
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
G-1	97-15-68-1X	Auxiliary Case Assembly (includes).....	1
	97-15-68	Auxiliary case.....	1
	NP-203	Name plate.....	1
	252-SP	Name plate.....	4
G-2	97-155-11	Gasket - Auxiliary / Main Case.....	1
G-3	545002-4	Bolt - 3/8" - 16 x 1 1/8" hex head self locking.....	17
G-4	97-223-23	Gasket - countershaft rear bearing cap.....	2
G-5	97-22-23	Bearing Cap - countershaft rear bearing cap.....	2
G-6	97-411-2	Bracket - air filter and regulator.....	1
G-7	545015	Bolt - 3/8" - 16 x 15/16".....	8
G-8	313607X	Kit - power control & mounting parts (includes G-8, G-9, G-10)	
	313042	Regulator / Filter	1
	545025-1	Elbow - regulator / filter.....	1
G-10	330831	Clamp - regulator / filter.....	1
G-11	545025--2	Elbow - range or splitter piston housing.....	4
G-12	330944	Reducer - .047" diameter orifice (splitter).....	2
G-13	330945	Reducer - .036" diameter orifice (range).....	2
G-15	97-501-26	Piston Housing.....	2
	97-501-26-6X	Splitter Piston Housing Assembly (includes G-11, G-12, G15)..	1
	97-501-26-7X	Range Piston Housing Assembly (includes G-11, G-13, G15)..	1
G-16	545002	Bolt - 3/8" - 16 x 1" hex head self locking (for piston box).....	8
G-17	330564-1	Lift Hook.....	2
G-18	545045	Nut - for splitter or range piston rod.....	2
G-19	97-136-14	Piston - for splitter or range.....	2
G-20	97-463-4	"O" Ring - for splitter or range piston rod.....	2
G-21	183-463-6	"O" Ring - for splitter or range piston rod.....	2
G-22	97-463-38	Pilot Spacer "O" Ring.....	2
G-23	97-37-32	Spacer - air cylinder pilot stop.....	2
G-24	97-463-5	"O" Ring - for splitter or range piston rod.....	2
G-28	97-65-45	Rod - Range Fork.....	1
G-29	97-66-118	Fork - Range Shift.....	1
G-30	97-65-46	Rod - Splitter Fork.....	1
G-31	545119	Bolt	2
G-32	97-66-116	Fork - Splitter Shift.....	1
G-33	500043-15	Pin - dowel (locator pin).....	2

MODEL PSO-16

Shifter Housing Assembly

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MODEL PSO-16

Shifter Housing Assembly

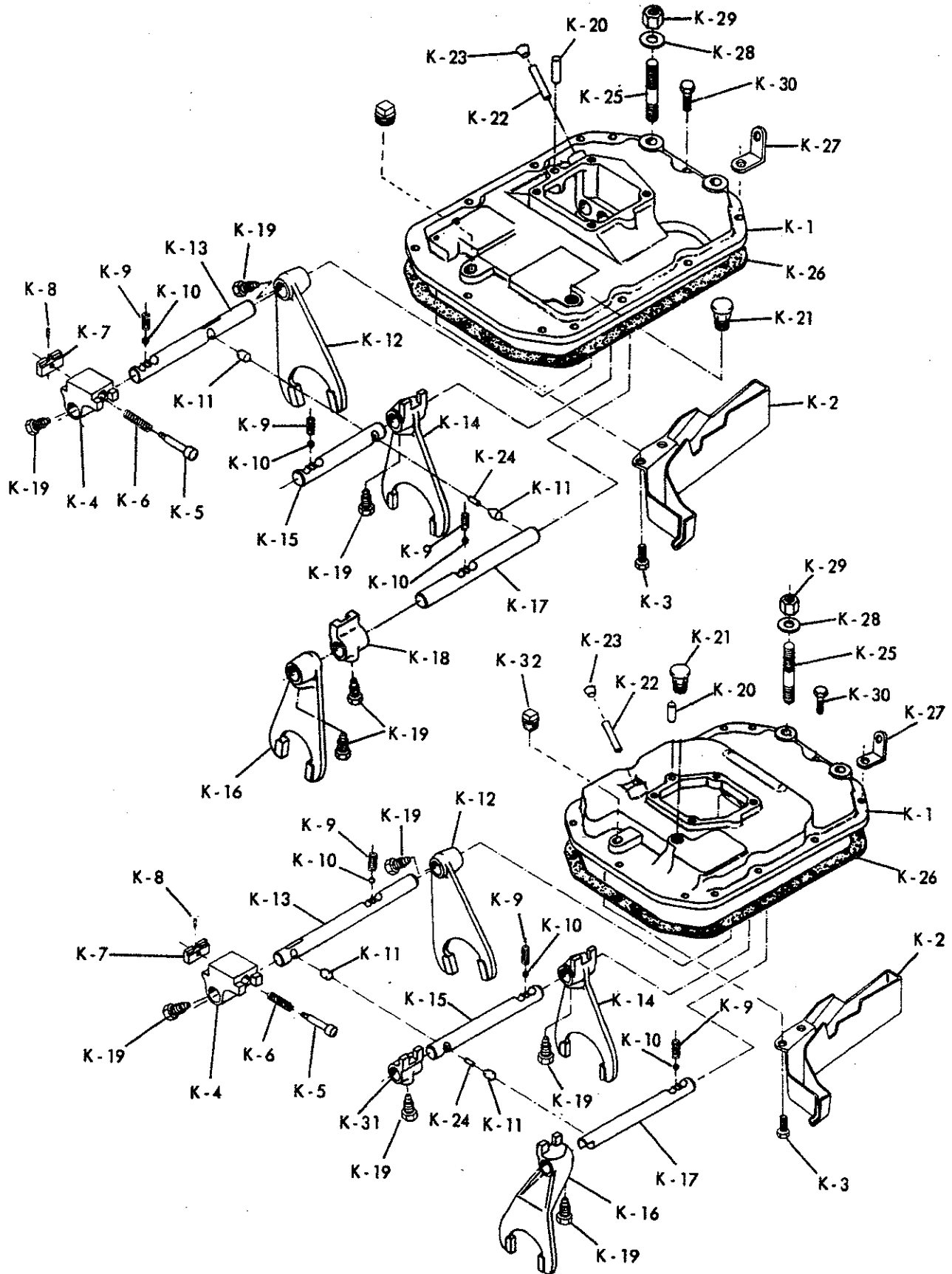
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Ref. No.	Part No.	Description	LOCATION			
			97-16-64-2X C	97-16-70-2X F	97-16-96-3X C	97-16-106-4X C
	See Tab Bills	Shifter Housing Assembly.....	1	1	1	1
K-1	97-16-64-1X	Shifter housing and oil trough assembly.....	1			
	97-16-70-1X	Shifter housing and oil trough assembly.....		1		
	97-16-96-2X	Shifter housing and oil trough assembly.....			1	
	97-16-106-3X	Shifter housing and oil trough assembly.....				1
NOT SHOWN	97-468-4	Oil Baffle - used in 97-16-96-3x & 97-16-106-3x				
	545021	Plug - for neutral safety switch.....	-	-	1	1
	97-438-19	Pin - for interlock poppet.....	-	-	-	1
	97-438-22	Plunger - for neutral safety switch.....	-	-	-	1
K-2	330957	Trough- oil.....	1	1	1	1
K-3	330800	Bolt - 3/8" - 16 x 3/4" flanged head self locking.....	2	2	2	2
K-4	97-354-11	Bracket - 1st - 4th & reverse shift rod.....	1	1	1	1
K-5	97-438-1	Plunger - 1st - 4th & reverse shift rod.....	1	1	1	1
K-6	97-72-12	Spring - 1st - 4th & reverse shift bracket.....	-	-	1	-
	97-72-2	Spring - 1st - 4th & reverse shift bracket.....	1	1	-	1
K-7	330736	Block - shift bracket.....	1	1	1	1
K-8	500593-6	Pin - 1st - 4th & reverse shift bracket.....	1	1	1	1
K-9	97-72-11	Spring - shift rod poppet ball.....	-	3	-	-
	97-72-26	Spring - shift rod poppet ball.....	3	-	3	-
	97-72-29	Spring - shift rod poppet ball.....	-	-	-	3
K-10	50-80-5	Ball - shift rod poppet.....	3	3	3	-
	50-80-4	Ball - shift rod poppet.....	-	-	-	3
K-11	97-12-1	Interlock.....	2	2	2	-
	97-12-2	Interlock.....	-	-	-	2
K-12	97-66-124	Fork - 1st - 4th & reverse shift.....	1	1	1	1
K-13	97-67-189	Rod - 1st - 4th & reverse shift.....	1	-	1	1
	97-67-190	Rod - 1st - 4th & reverse shift.....	-	1	-	-
	97-67-230	Rod - 1st - 4th & reverse shift.....	-	-	-	1
K-14	97-66-24	Fork - 5th - 12th shift.....	1	1	1	1
K-15	97-67-86	Rod - 5th - 12th shift.....	1	-	1	-
	97-67-102	Rod - 5th - 12th shift.....	-	1	-	-
	97-67-231	Rod - 5th - 12th shift.....	-	-	-	1
K-16	97-66-5	Fork - 13th - 16th shift.....	1	-	1	1
	97-66-37	Fork - 13th - 16th shift.....	-	1	-	-
K-17	97-67-88	Rod - 13th - 16th shift.....	1	-	1	-
	97-67-103	Rod - 13th - 16th shift.....	-	1	-	-
	97-67-247	Rod - 13th - 16th shift.....	-	-	-	1

MODEL PSO-16

Shifter Housing Assembly

HDPS-1620-0599



MODEL PSO-16

Shifter Housing Assembly

Continued

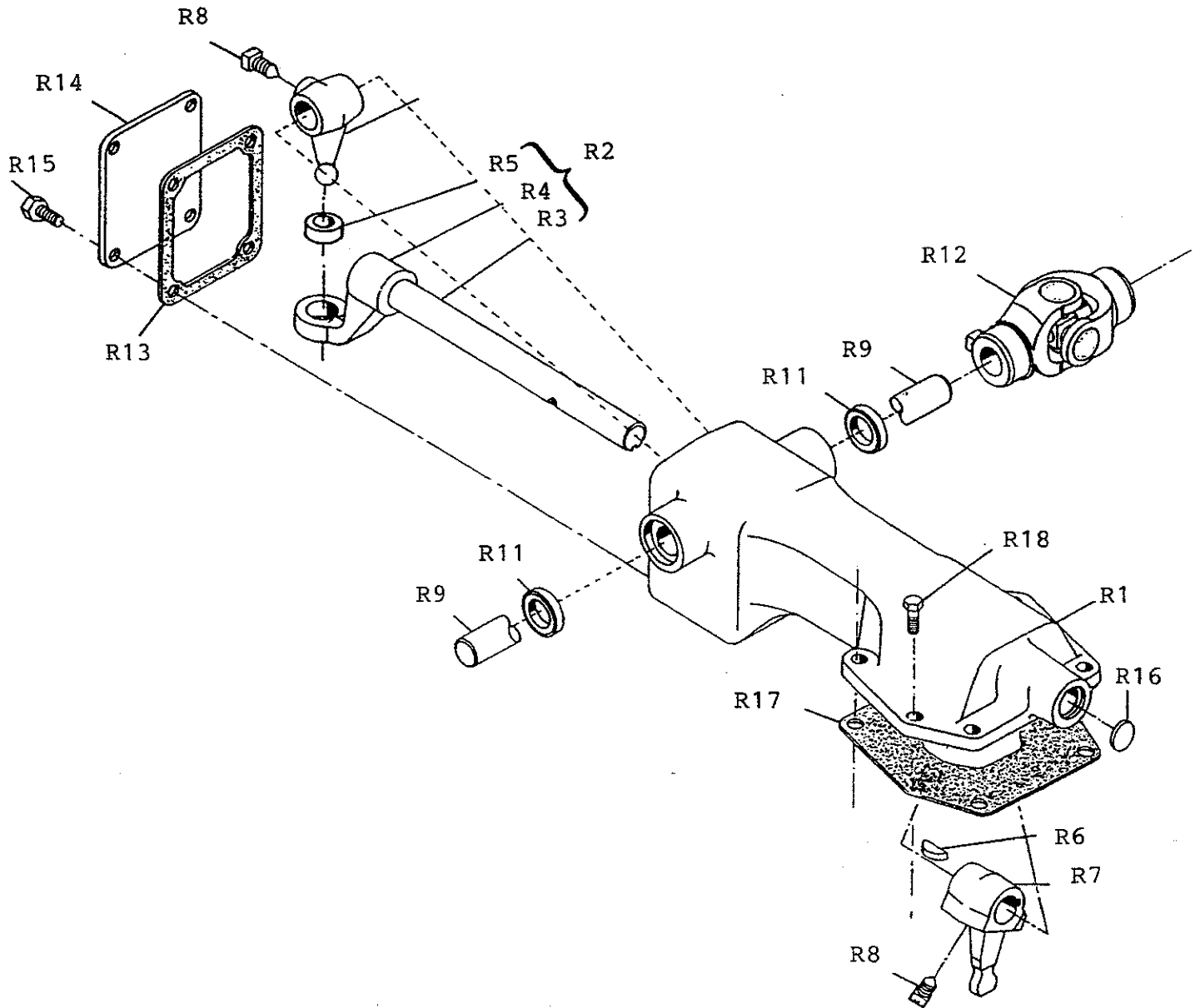
HDPS-1620-0599

Ref. No.	Part No.	Description	97-16-64-2X	97-16-70-2X	97-16-96-3X	97-16-106-4X
			C	F	C	C
		LOCATION				
K-18	97-354-6	Bracket - 13th - 16th shift.....	1	-	1	1
K-19	545011	Bolt - for shift fork.....	5	5	5	5
K-20	545000	Locator Pin	1	-	1	1
	545010	Locator Pin	-	1	-	-
K-21	312268	Breather	1	1	1	1
K-22	330739-1	Pin - reverse switch.....	1	1	1	1
K-23	500897-11	Plug - reverse switch hole (shipping).....	1	1	1	1
K-24	194-SP	Pin - interlock.....	1	1	1	-
<u>Ref. No. K-25, K-26, K-27, K-28, K-29, K-30 are NOT included in assembly</u>			****	****	****	****
K-25	330360-15	Stud - 5/8" - 11 and 5/8" - 18 x 3 1/2".....	-	-	2	2
	330360-18	Stud - 5/8" - 11 and 5/8" - 18 x 4".....	2	2	-	-
K-26	97-155-1	Gasket - shifter housing.....	1	1	1	1
K-27	330564-1	Hook - lift.....	4	4	4	4
K-28	500365-46	Washer - shifter housing mounting stud.....	2	2	2	2
K-29	500371-7	Nut - shifter housing mounting stud.....	2	2	2	2
K-30	545002-4	Bolt - 3/8" - 16 x 1 1/8" hex head self locking.....	10	10	10	10
K-31	97-354-3	Bracket - 3rd, 4th, 5th, 6th shift.....	-	1	-	-
K-32	500114	Plug - oil return hole.....	1	1	1	1

MODEL PSO-16

Remote Control Assembly

HDPS-1620-0599



MODEL PSO-16

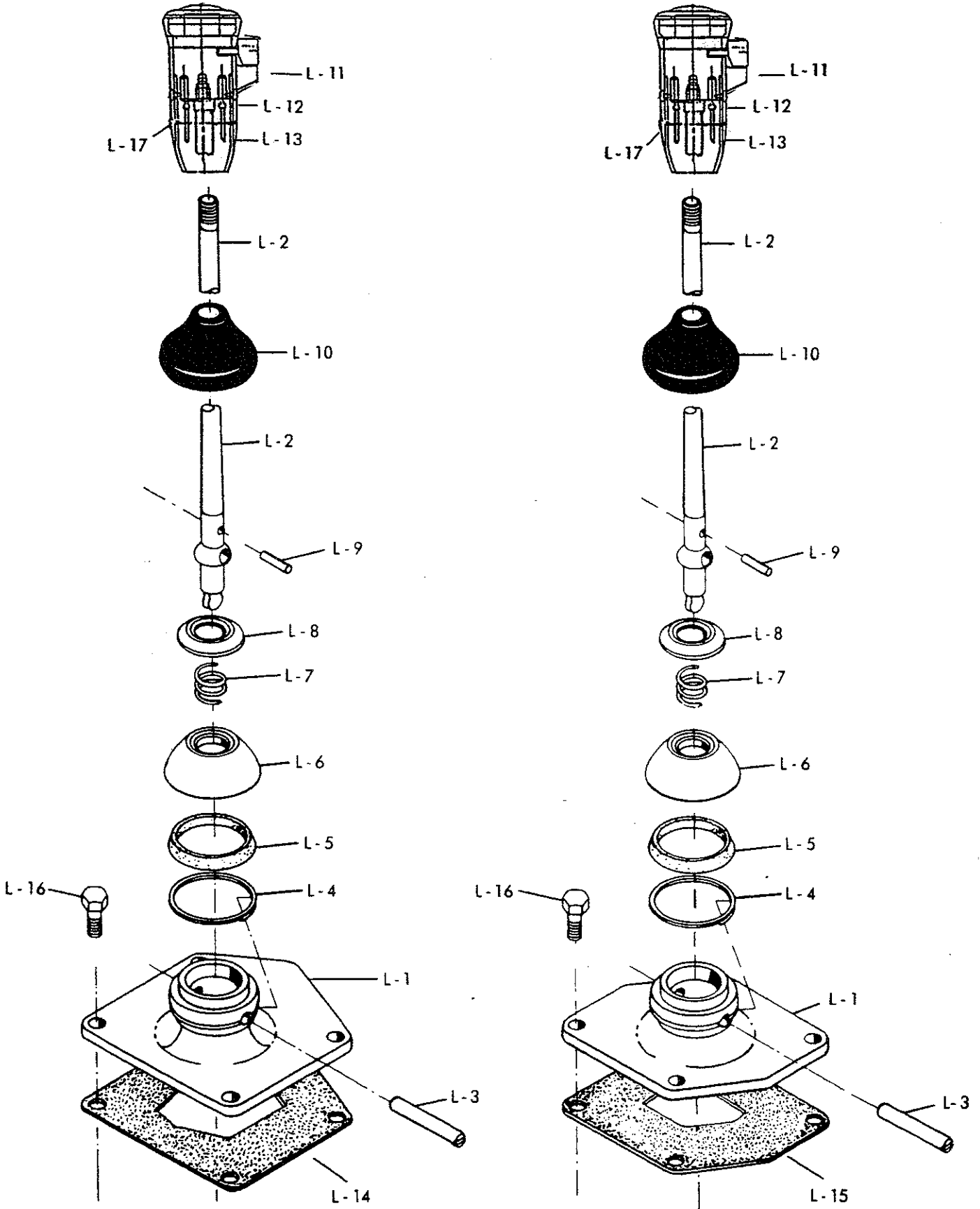
Remote Control Assembly

HDPS-1620-0599

Ref. No.	Part No.	Description	8049-X	8049-1X	311695-4X	311890-1X	97-16-42-1X
Cover & Joint Assembly - remote control							
	311866X	Cover Assembly.....	1	1	-	-	-
	311914X	Cover Assembly.....	-	-	-	1	-
	312918X	Cover Assembly.....	-	-	1	-	-
	97-16-42-2x	Cover Assembly.....	-	-	-	-	1
R-1	N.S.S	Remote Control Cover.....	1	1	1	1	1
N.S.	82-24-3	Bushing - remote control cover.....	4	4	4	4	4
R-2	8039X	Shift Finger Rod and Bracket Assembly.....	1	1	-	-	-
R-2	311888X	Shift Finger Rod and Bracket Assembly.....	-	-	-	1	-
R-2	312917X	Shift Finger Rod and Bracket Assembly.....	-	-	1	-	-
R-2	97-65-17-1X	Shift Finger Rod and Bracket Assembly.....	-	-	-	-	1
R-3	N.S.S.	Rod - shift finger.....	1	1	1	1	1
R-4	N.S.S.	Bracket - shift finger rod.....	1	1	1	1	1
R-5	85-24-4	Bushing - shift rod bracket.....	1	1	1	1	1
N.S.	N.S.S.	Woodruff Key #11 (part of assembly).....	1	1	1	1	1
R-6	500007-19	Woodruff Key # 11.....	1	1	1	1	1
R-7	82-6-9	Finger - inner shift.....	1	1	1	1	1
R-8	545063	Bolt.....	2	2	2	2	2
R-9	82-65-5	Rod - remote control shift.....	1	1	-	1	-
R-9	82-65-22	Rod - remote control shift (counter sunk spot at 90)	-	-	1	-	1
R-10	82-6-7	Finger - outer shift.....	1	1	1	1	1
R-11	28P-19	Seal - remote control shift rod.....	2	2	2	2	2
R-12	10380-SF	U - Joint Assembly - control rod.....	1	1	1	1	1
R-13	82-118-1	Gasket - aperture cover.....	1	1	1	1	1
R-14	82-96-1	Aperture Cover.....	1	1	1	1	1
R-15	545005-1	Bolt - 5/16" - 18 x 5/8".....	4	4	4	4	-
R-15	500397-8	Bolt.....	-	-	-	-	4
N.S.	500357-10	Washer.....	-	-	-	-	4
R-16	500166-16	Expansion Plug - 1 1/16".....	1	1	1	1	1
N.S.	311903X	Boot Kit - remote control.....	-	1	1	1	1
N.S.	82-483-1	Boot - standard.....	-	1	1	1	1
N.S.	82-483-2	Boot - cup type.....	-	1	1	1	1
N.S.	LW-3-9	Lockwire.....	-	3	3	3	3
<u>Parts Listed Below Are Not Included In Assembly</u>							
R-17	97-155-12	Gasket - to remote control cover (six holes).....	1	1	1	1	1
R-18	545028-4	Bolt - 7/16" - 14 x 1 1/8" hex head self locking.....	6	6	6	6	6

MODEL PSO-16

Shift Tower Group



MODEL PSO-16

Shift Tower Group

HDPS-1620-0599

Ref. No.	Part No.	Description	LOCATION	
			85-16-37-17X C	97-16-27-25X F
L-1	85-16-37	Shift Tower (center control).....	1	-
	97-16-27	Shift Tower (forward control).....	-	1
L-2	25Q-1570	Shift Lever (Length 33" Straight).....	1	-
	25Q-1702-59	Shift Lever (Length 28.5" Straight).....	-	1
L-3	53Q-15	Shaft - for shift lever.....	1	1
L-4	62-381-7	Snap Ring - for shaft.....	1	1
L-5	69Q-6	Washer - shift lever compression.....	1	1
L-6	54Q-13	Cup - shift lever compression.....	1	1
L-7	56Q-25	Spring - shift lever compression.....	1	1
L-8	55Q-7	Collar - shift lever compression.....	1	1
L-9	286-SP	Pin - shift lever compression collar.....	1	1
L-10	55Q-5	Grommet - shift lever.....	1	1
Parts Listed Below Are Not Included In Assembly				
L-11	313816	Selector Valve.....	1	
L-12	312526	Connector - for valve and air lines.....	6	
L-13	85-420-1	Tubing - air line.....	1	
L-14	97-155-12	Gasket - for center control housing.....	1	
L-15	97-155-13	Gasket - for forward control housing.....	1	
L-16	545028-4	Bolt - 7/16" - 14 x 1 1/8" hex head self locking.....	4	
L-17	500803	Nut - for selector valve.....	1	

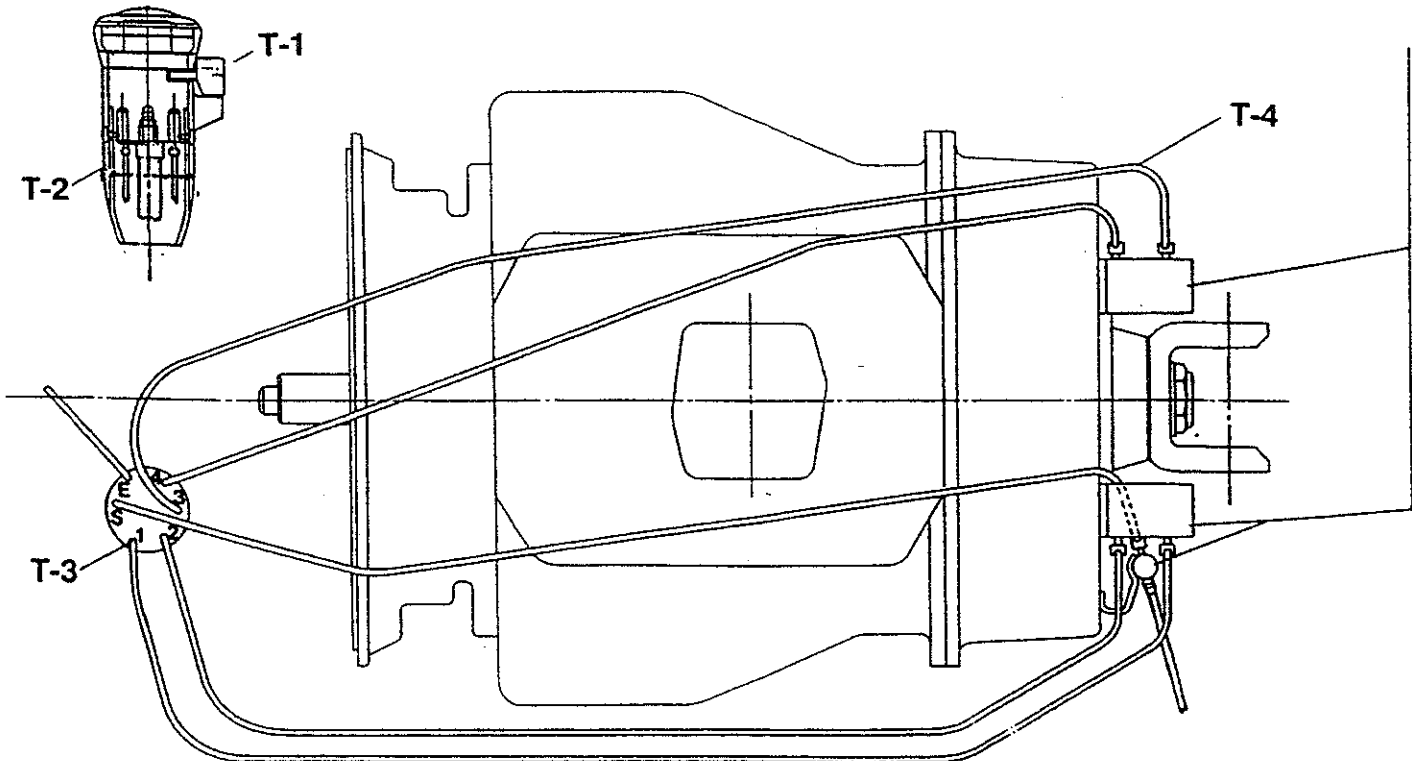
MODEL PSO-16

Air Control Piping Diagram And Parts

HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
	313557X	Control Parts Kit - (includes all below except 85-420-1-1).....	1
T-1	313816	Valve - air splitter control.....	1
T-2	500803	Jam Nut - shift lever.....	1
T-3	312526	Line Connector - valve to air line.....	6
T-4	85-420-1	Tubing - air line (50 feet).....	1
T-4	85-420-1-1	Tubing - air line (100 feet).....	1
Not Shown	330717	Zip Slider.....	1
	330716-1	Protective Cover for Tubing.....	1
	2798	Service Bulletin - piping diagram.....	1
	2799	Service Bulletin - piping diagram.....	1
	2857	Service Bulletin - direct air control diagram.....	1

SEE PAGES 14 AND 15



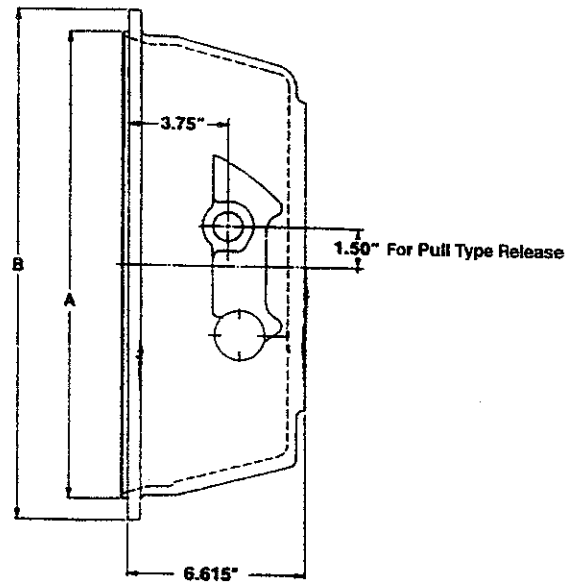
MODEL PSO-16

Clutch Housing Dimensions

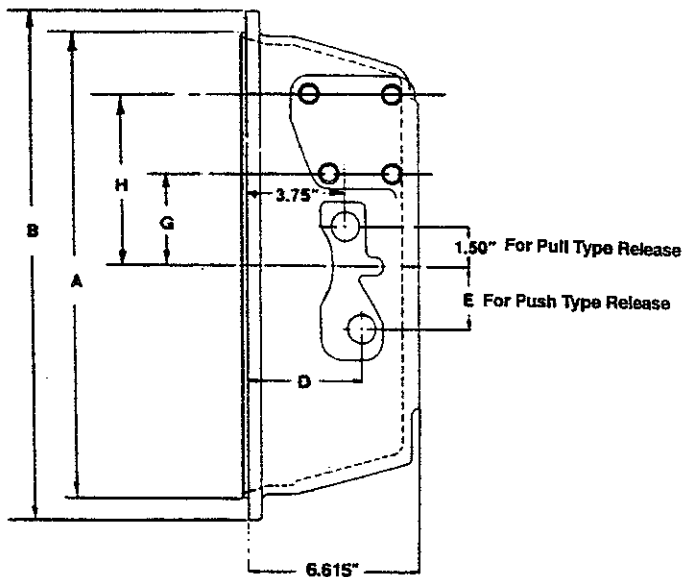
HDPS-1620-0599

Part No.	Casting No.	Material	SAE #	D Lower Hole Dim. Face. To Center Hole	E Below Center	G	H	For Service Use
97-518-3	C97-518-4	Iron	2	4.187"	2.625"	-	-	312795X
97-518-14	C97-518-7	Iron	2	4.375"	2.375"	3.50"	6.50"	97-518-14-1X
97-518-15	C97-518-2	Iron	1	4.187"	2.625"	-	-	97-518-15-1X
97-518-25	C97-518-13-1	Iron	1	3.750"	1.500"	4.00"	8.50"	97-518-25-1X
97-518-63	C97-518-2-2	Iron	1	-	-	-	-	97-518-63-1X

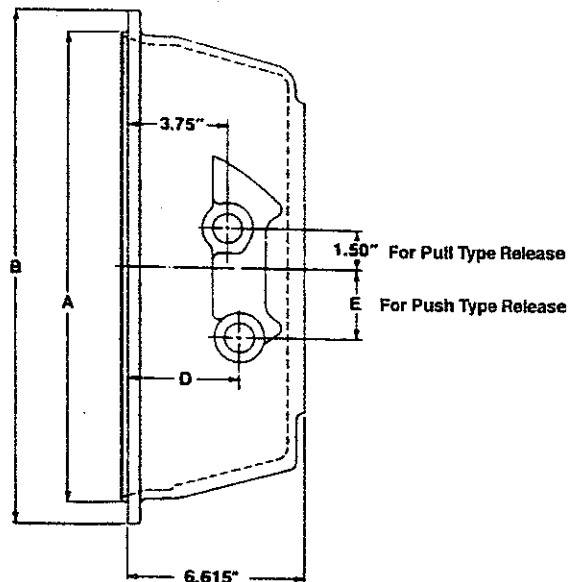
SAE		
Size No.	A Pilot Dia.	B O.D.
1	20 $\frac{1}{8}$ "	21 $\frac{1}{4}$ "
2	17 $\frac{3}{8}$ "	19 $\frac{1}{4}$ "



STANDARD MOUNT



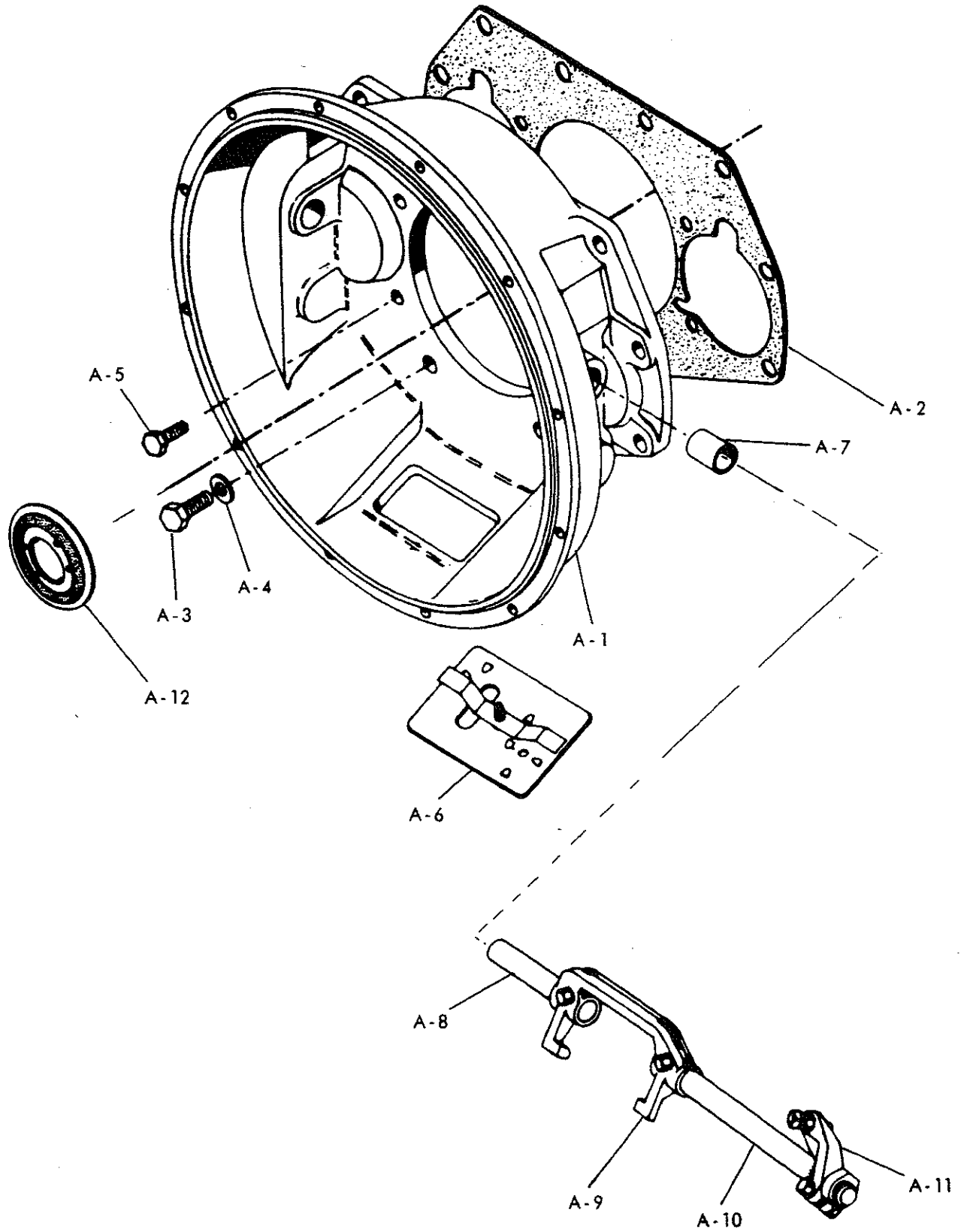
NODAL MOUNT



STANDARD MOUNT

MODEL PSO-16

Clutch Housing Group



MODEL PSO-16

Clutch Housing Group

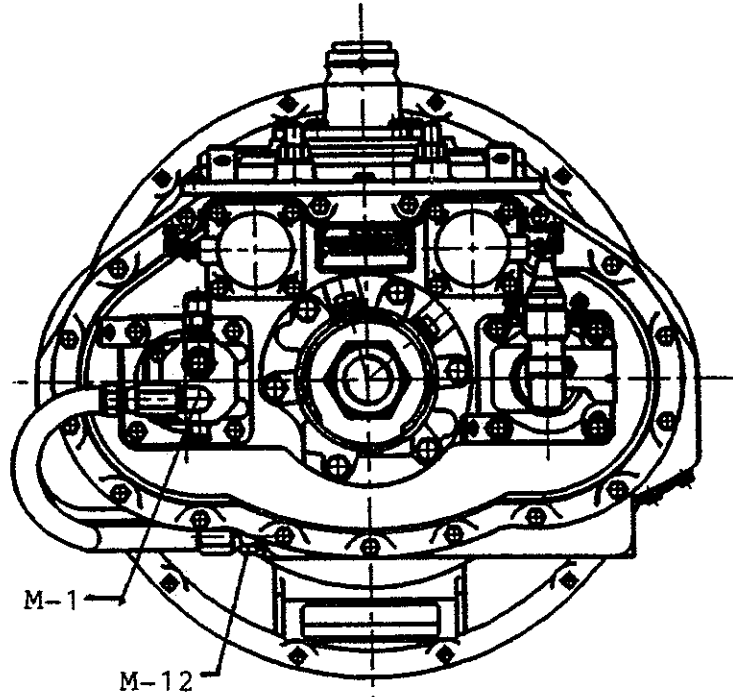
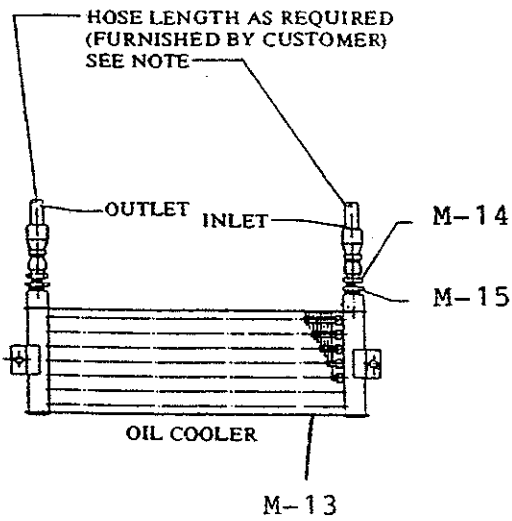
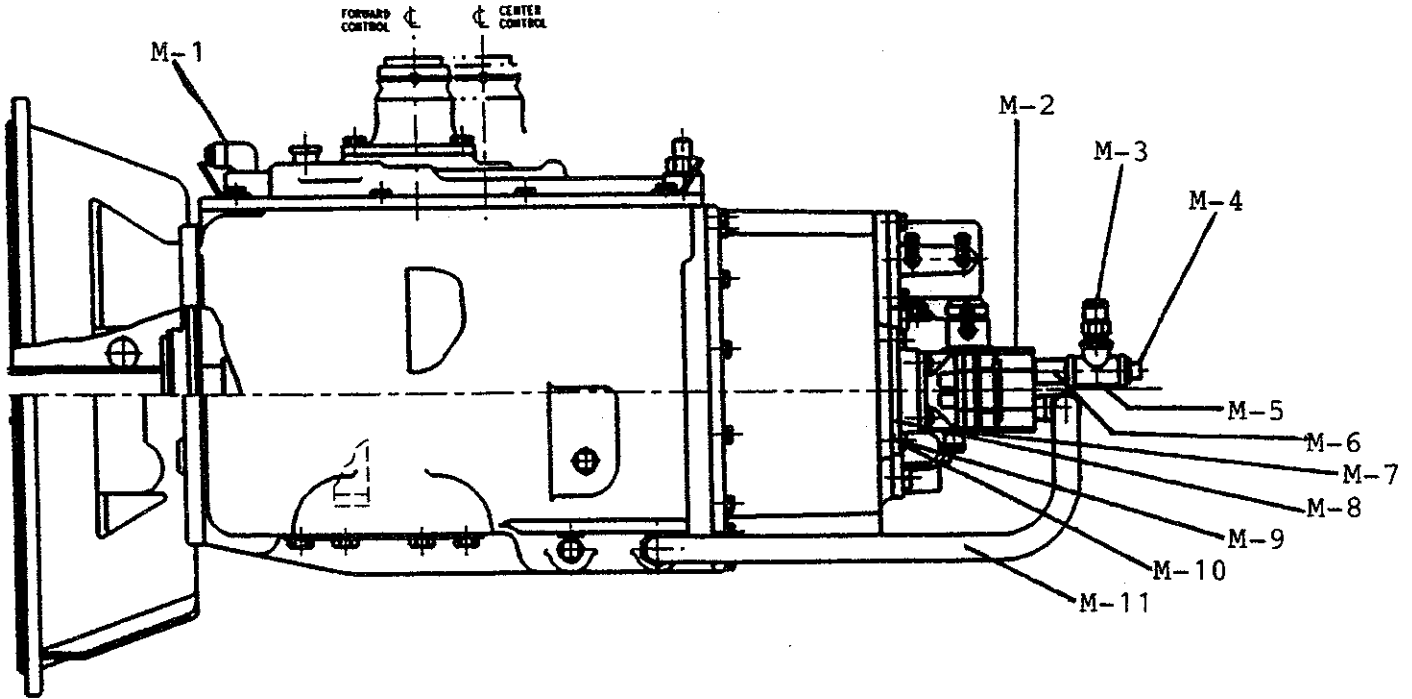
HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
CLUTCH HOUSING			
A-1	See Tab Bills	Clutch Housing Assembly.....	1
A-2	97-352-1	Gasket.....	1
A-3	545008-3	Bolt - 5/8"-11x1 3/4" hex head self locking.....	10
A-4	330829	Flat Washer - 5/8"	10
A-5	545001	Bolt - 1/2"-13x1 1/4" hex head self locking.....	4
A-6	97-96-18-1X	Hand Hole Adjustment Cover Assembly (includes).....	1
	97-96-18	Cover.....	1
	330863	Spring.....	1
	545037	Screw.....	1
CLUTCH RELEASE PARTS			
A-7	128C-20	Bushing - for clutch release shaft.....	2
A-8		Clutch Release Shaft - Short.....	1
	106C-1185	Short (Length 5.750")	
	106C-1498	Short (Length 6.500")	
A-9		Clutch Release Yoke.....	1
	105C-117	For Lipe Rollway, Borg, and Beck push type clutch	
	105C-137	For Spicer 14" or 15 1/2" (2 plate) pull type clutch	
		Clutch Release Yoke Attaching Parts (includes)	
	330231	Bolt - for clutch release yoke.....	2
	500356-12	Lock Washer - for clutch release yoke bolt.....	2
	10-30	Key.....	1
A-10		Clutch Release Shaft - Long	1
	106C-438	Long (Length 14.000")	
	106C-617	Long (Length 10.469")	
	106C-939	Long (Length 10.000")	
	106C-1047	Long (Length 9.468")	
	106C-1094	Long (Length 8.469")	
	106C-1123	Long (Length 12.968")	
A-11		Clutch Pedal Adjustment Arm.....	1
	310233X	For left side mounting	
	310473X	For right side Mounting	
A-12	127760X	Clutch Brake.....	1

MODEL PSO-16

Oil Cooler Kit

HDPS-1620-0599

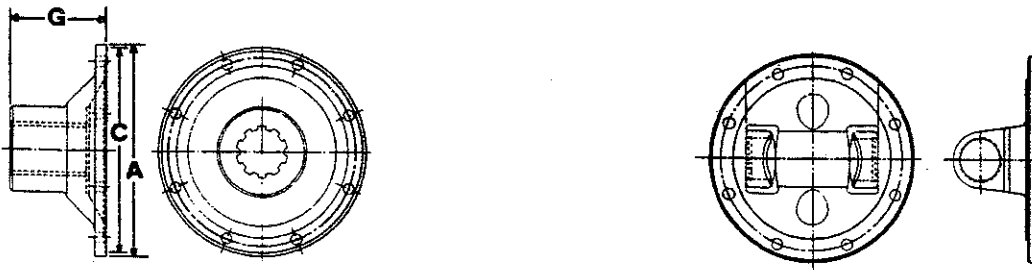


MODEL PSO-16

Oil Cooler Kit

HDPS-1620-0599

Ref. No.	Part No.	Description	Qty.
	313411-1X	Oil Cooler Kit.....	1
		Kit Contains: 313411-3X.....	1
		313444X.....	1
	313411-3X	Pump and Adapter Kit (includes M-1 - M-12).....	1
M-1	545051	Elbow - pump outlet.....	2
M-2	313292	Oil pump Assembly.....	1
M-3	545036	Connector - pump outlet.....	1
M-4	500114	Plug - pump outlet tee.....	1
M-5	545146	Tee - pipe (pump outlet).....	1
M-6	545049-1	Nipple - pump outlet.....	1
M-7	70-223-25	Gasket - oil pump.....	1
M-8	97-22-19	Bearing Cap - countershaft rear.....	1
M-9	545002-6	Bolt - 3/8" - 16 x 1 1/4" hex head self locking.....	4
M-10	97-223-23	Gasket - countershaft rear bearing cap.....	1
M-11	313117-4	Hose Assembly - case outlet to pump inlet.....	1
M-12	313229	Filter - oil screen assembly.....	1
	313444X	Oil Cooler and Adapter Fittings (includes M-13-M-15)	1
M-13	313110	Oil Cooler Assembly.....	1
M-14	500714-14	Bushing - reducer for cooler inlet and outlet.....	2
M-15	545036	Adapter Fitting - for cooler inlet and outlet.....	2

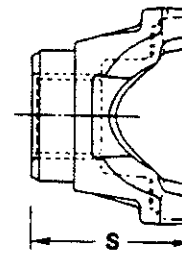
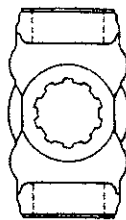
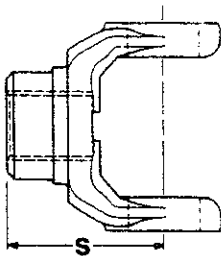


COMPANION FLANGE

FLANGE YOKE

Companion Flanges and Flange Yokes

A Joint Series	Flange Diameter	Companion Flange Assembly	Companion Flange	G to Flange Face Length	C Pilot Diameter F-Female M-Male	Mates With	
						Flange Yoke	Series
1710	8"	—	6-1-4881	3"	F-7 ³ / ₄ "	6-2-749	1710
1710	8"	—	6-1-4571	3"	F-7 ³ / ₄ "	6-2-749	1710
1810	8"	—	6.5-1-1981	3"	F-7 ³ / ₄ "	6.5-2-329	1810
1810	8"	—	6.5-1-1991	3"	F-7 ³ / ₄ "	6.5-2-329	1810
1810	8"	—	6.5-1-2151	2 ³ / ₄ "	F-7 ³ / ₄ "	6.5-2-329	1810



FULL ROUND

U-BOLT—BRG. STRAP—HALF ROUND

Series	Yoke Style	End Yoke Part Number	S End of Hub To Center Line Length	Momentary Joint Angle	Brake Size
1610	Half Round	5-4-65-31	5 ¹ / ₁₆ "	21 ¹ / ₂ °	—
1710	Full Round	6-4-5351	5 ³ / ₁₆ "	21°	—
1710	Half Round	6-4-5351-1	5 ³ / ₁₆ "	21°	—
1710	Full Round	6-4-7691	5 ³ / ₁₆ "	20°	—
1710	Half Round	6-4-7691-1	5 ³ / ₁₆ "	20°	—
1760	Full Round	6.3-4-41	5 ⁹ / ₁₆ "	30°	—
1760	Half Round	6.3-4-41-1	5 ⁹ / ₁₆ "	30°	—
1760	Full Round	6.3-4-1251	5 ⁹ / ₁₆ "	30°	—
1760	Half Round	6.3-4-1251-1	5 ⁹ / ₁₆ "	30°	—
1810	Full Round	6.5-4-3021	5 ⁹ / ₁₆ "	30°	—
1810	Full Round	6.5-4-3821	5 ⁹ / ₁₆ "	30°	—
1810	Half Round	6.5-4-3821-1	5 ⁹ / ₁₆ "	30°	—

MODEL PSO-16

Service Parts Kits

HDPS-1620-0599

Part No.	Description	Qty.
MAJOR SERVICE KIT		
313400-42X	Major Service Kit.....	1
500566-8	Ball - reverse idler shaft.....	2
500010-8	Woodruff Key #29.....	10
545065	Nut - mainshaft output.....	1
97-59-2	Stop Pin and Plug.....	1
545060	Neutral Switch Plug.....	1
97-35-34	Drive Gear 2" - 10 spline.....	1
313574X	Gasket and "O" Ring Kit.....	2
313401-20X	Thrust Washer Kit.....	1
313429-1X	Shifter Housing Small Parts Kit.....	1
313432-9X	Minor Service Kit.....	1
MINOR SERVICE KIT (Included in Major Service Kit)		
313432-9X	Minor Service Kit.....	1
BEARINGS		
<u>Front Case</u>		
550952	Countershaft - front.....	2
550886	Reverse Idler Shaft.....	4
550925	Mainshaft - rear.....	1
550944	Drive Gear.....	1
550889	Input Shaft - pocket.....	1
550969	Countershaft - rear.....	2
<u>Rear Case</u>		
550899	Countershaft - cup front.....	2
550900	Countershaft - cone front.....	2
550921	Output Shaft - pocket.....	1
550925	Output Shaft.....	1
550935	Countershaft - cup rear.....	2
550936	Countershaft - cone rear.....	2
550932	Auxiliary Mainshaft - needle bearing.....	1
97-463-32	Oil Seal - drive gear.....	1
97-463-33	Oil Seal - mainshaft rear.....	1
97-463-35	"O" Ring - splitter & range piston housing.....	2
545077	Bearing Lubricant.....	1
545080-1	Loctite.....	1
2770	Bearing Lube Instructions.....	1
2783	Loctite Application for M/S Nuts.....	1
2775	Pocket Bearing Installation Instructions.....	1
2836	Assembly Instructions.....	1
2374	Service Manual for 16 & 18 speeds.....	1
313024-9X	Snap Ring Kit.....	1
312475-35X	Gasket Kit.....	1

MODEL PSO-16

Service Parts Kits

HDPS-1620-0599

Part No.	Description	Qty.
Included in MAJOR SERVICE KIT		
313574X	Gasket and "O" Ring Kit.....	2
183-463-6	"O" Ring - piston rod to piston.....	2
2726	Service Bulletin.....	2
2803	Bulletin - assembly instructions.....	2
2836	Bulletin - assembly instructions.....	2
330895	Lubricant - "O" ring.....	2
97-223-25	Gasket - splitter or range piston housing.....	2
97-463-35	"O" Ring - splitter & range piston housing pilot spacer	2
97-463-38	"O" Ring - splitter & range piston housing pilot spacer	2
97-463-4	"O" Ring - piston.....	2
97-463-5	"O" Ring - piston rod to piston.....	2
313401-20X	Thrust Washer Kit.....	1
330730	Mainshaft - internal (15T).....	3
330810	Mainshaft - external (24T).....	2
330814	Mainshaft - external (20T).....	3
330869	Mainshaft - internal (18T).....	3
97-47-4	Mainshaft - bearing.....	1
313429-1X	Shifter Housing Small Parts Kit.....	1
97-12-1	Interlock Pin	3
50-80-5	Poppet Ball.....	3
194-SP	Shift Rod Pin.....	1
97-438-1	Plunger - 1st and reverse.....	1
330739-1	Pin - backup lite.....	1
500593-6	Pin - plunger.....	1
545000	Blocker Pin - (center control).....	1
545010	Blocker Pin - (forward control).....	1
97-72-2	Spring - 1st and reverse.....	1
97-72-11	Spring - poppet ball.....	3
97-72-12	Spring - plunger.....	1
Included in MAJOR and MINOR SERVICE KITS		
313024-9x	Snap Ring Kit.....	1
97-381-1	Mainshaft - internal small.....	3
97-381-2	Mainshaft - internal.....	1
97-381-4	Mainshaft - external.....	3
97-381-30	Countershaft - retainer front.....	2
97-381-31	Mainshaft - internal.....	2
97-381-32	Mainshaft - internal.....	2
97-381-34	Countershaft - backing rear.....	2
97-381-1	Mainshaft - external.....	3
97-381-2	Mainshaft - internal.....	1

MODEL PSO-16

Service Parts Kits

HDPS-1620-0599

Part No.	Description	Qty.
Included in MAJOR and MINOR SERVICE KITS		
312475-35X	Gasket Kit.....	1
82-118-1	Remote Control - aperture cover.....	1
97-155-1	Shifter Housing.....	1
97-155-11	Rear Case to Front Case.....	1
97-155-12	Tower - center (6 holes).....	1
97-155-13	Tower - forward (4 holes).....	1
97-223-1	Bearing Cap - drive gear.....	1
97-223-2	Bearing Cap - mainshaft (rear case).....	1
97-223-8	Cover - without air control.....	1
97-223-23	Bearing Cap - countershaft rear case.....	2
97-223-25	Piston Housing - air control.....	2
97-352-1	Clutch Housing.....	1
97-324-1-1X	P.T.O 6 Bolt Gasket Kit.....(includes).....	1
330950	Tag - Instruction.....	1
97-324-1	Gasket - P.T.O. Aperture Cover (6 hole).....	1
97-324-2-1X	P.T.O. 8 Bolt Gasket Kit.....(includes).....	1
330950	Tag - Instruction.....	1
97-324-2	Gasket - P.T.O. Aperture Cover (8 hole).....	1

Tab No.	Used By	For Use With Clutch	CLUTCH HOUSING			Drive Gear Input Shaft	Drive Gear Bearing Cap	Front Case Assembly
			S A E	Assembly Number	Rel. Code Page			

301641- Model PSO150-16A

-2	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-3	Navistar	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-4	Peterbilt	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-5	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-6	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-7	Navistar	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-8	Freightliner	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-61-1X
-9	Western Star	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-61-1X
-10	Western Star	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-61-1X

301647- Model PSO150-16B

-1	General	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-2	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-3	Volvo	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-4	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-5	Spicer DT	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-6	Navistar	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-7	Western Star	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-8	Spicer DT	Pull Type	1	LESS		97-35-34	97-19-36-1X	97-15-90-1X
-9	Spicer DT	Pull Type	1	LESS		97-35-34	97-19-36-1X	97-15-90-1X
-10	Mertz-Tyler	Pull Type	2	97-518-3-2X		97-35-34	97-19-36-1X	97-15-90-1X
-11	Western Star	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-12	Volvo	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-13	Navistar	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-14	MTruck UK	Pull Type	2	97-518-14-2X		97-35-34	97-19-36-1X	97-15-90-1X

301583- Model PSO165-16B

-1	Western Star	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-3	Navistar	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-4	General	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X
-5	Navistar	Pull Type	1	97-518-25-2X		97-35-34	97-19-36-1X	97-15-90-1X

301584- Model PSO175-16B

-1	Peterbilt	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-2	General	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X
-5	Spicer DT Aust	Pull Type	1	97-518-63-2X		97-35-34	97-19-36-1X	97-15-90-1X

Tab No.	Rear Case Assembly	Mainshaft Rear Bearing Cap Assembly	SPEEDOMETER		End Yoke or Companion Flange	SHIFTER		
			Drive Gear	Driven Gear		Housing Assembly Pages	Lever & Dome Ass'y Pages	Remote Control Pages

301641- Model PSO150-16A

-2	97-15-68-1X	97-19-60-1X				97-16-70-2X		
-3	97-15-68-1X	97-19-60-1X				97-16-70-2X		
-4	97-15-68-1X	97-19-60-1X				97-16-64-2X		
-5	97-15-68-1X	97-19-60-1X				97-16-64-2X		
-6	97-15-68-1X	97-19-60-1X				97-16-64-2X		
-7	97-15-68-1X	97-19-60-1X				97-16-64-2X		
-8	97-15-68-1X	97-19-60-1X	97-452-14		6.3-4-41-1	97-16-106-4X		
-9	97-15-68-1X	97-19-60-1X	97-452-14			97-16-106-4X		
-10	97-15-68-1X	97-19-60-1X	97-452-22			97-16-70-2X		

301647- Model PSO150-16B

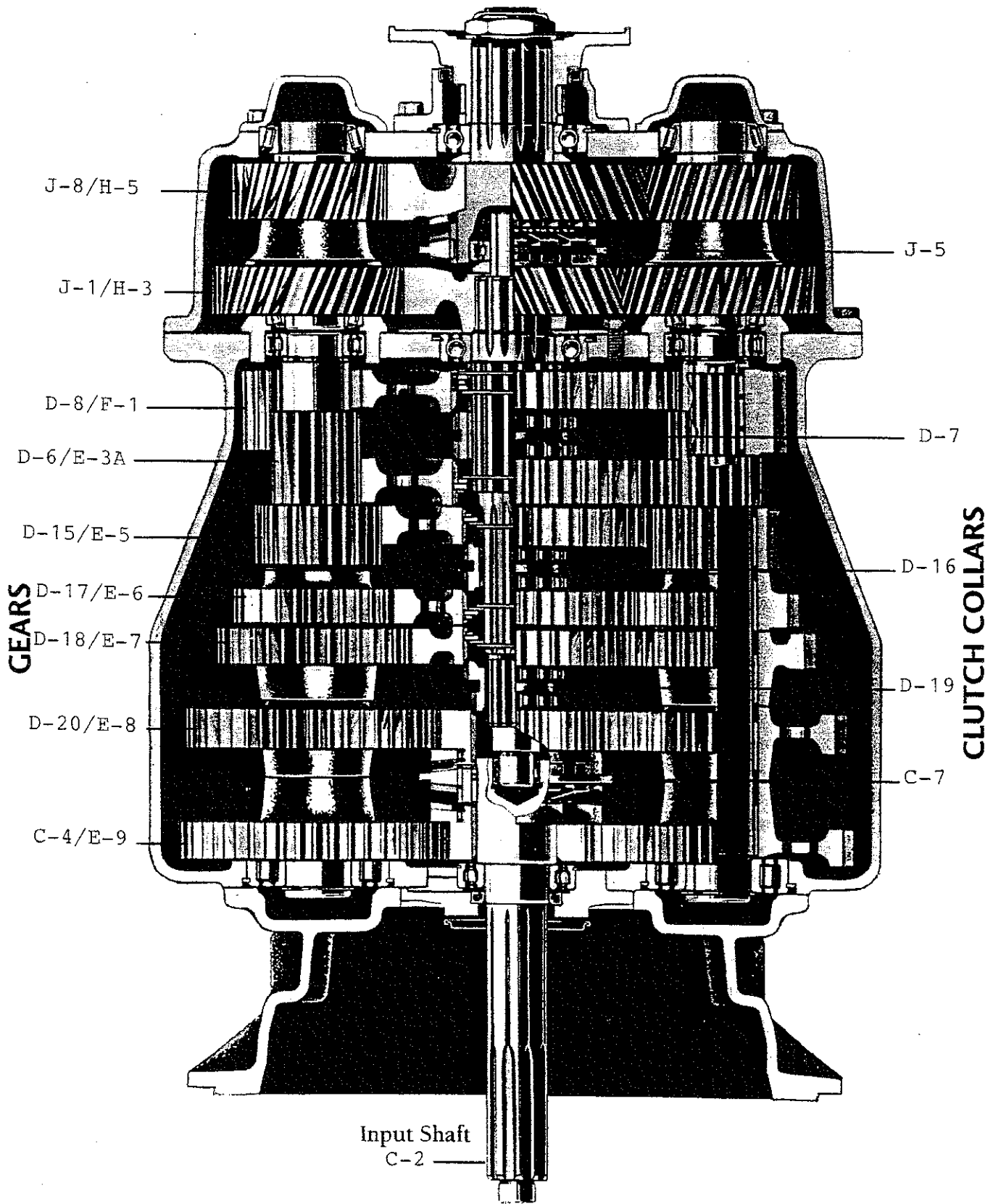
-1	97-15-68-1X	97-19-60-1X	97-452-22			97-16-106-4X		
-2	97-15-68-1X	97-19-51-1X				97-16-96-3X		
-3	97-15-68-1X	97-19-60-1X	97-452-22			97-16-106-4X		
-4	97-15-68-1X	97-19-60-1X				97-16-70-2X		
-5	97-15-68-1X	97-19-51-1X				97-16-96-3X		
-6	97-15-68-1X	97-19-60-1X				97-16-70-2X		
-7	97-15-68-1X	97-19-51-1X	97-452-22			97-16-106-4X		
-8	97-15-68-1X	97-19-51-1X	97-452-22			97-16-64-2X		
-9	97-15-68-1X	97-19-51-1X	97-452-22			97-16-64-2X		
-10	97-15-68-1X	97-19-60-1X	97-452-22		6-4-5351	97-16-106-4X		
-11	97-15-68-1X	97-19-51-1X	97-452-22			97-16-70-2X		
-12	97-15-68-1X	97-19-60-1X	97-452-22			97-16-106-4X		
-13	97-15-68-1X	97-19-51-1X				97-16-106-4X		
-14	97-15-68-1X	97-19-51-1X			5-4-6531-1	97-16-106-4X		

301583- Model PSO165-16B

-1	97-15-68-1X	97-19-51-1X	97-452-22			97-16-106-4X		
-3	97-15-68-1X	97-19-51-1X				97-16-70-2X		
-4	97-15-68-1X	97-19-51-1X				97-16-96-3X		
-5	97-15-68-1X	97-19-51-1X				97-16-96-3X		

301584- Model PSO175-16B

-1	97-15-68-1X	97-19-51-1X				97-16-96-3X		
-2	97-15-68-1X	97-19-51-1X				97-16-96-3X		
-5	97-15-68-1X	97-19-51-1X				97-16-96-3X		





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