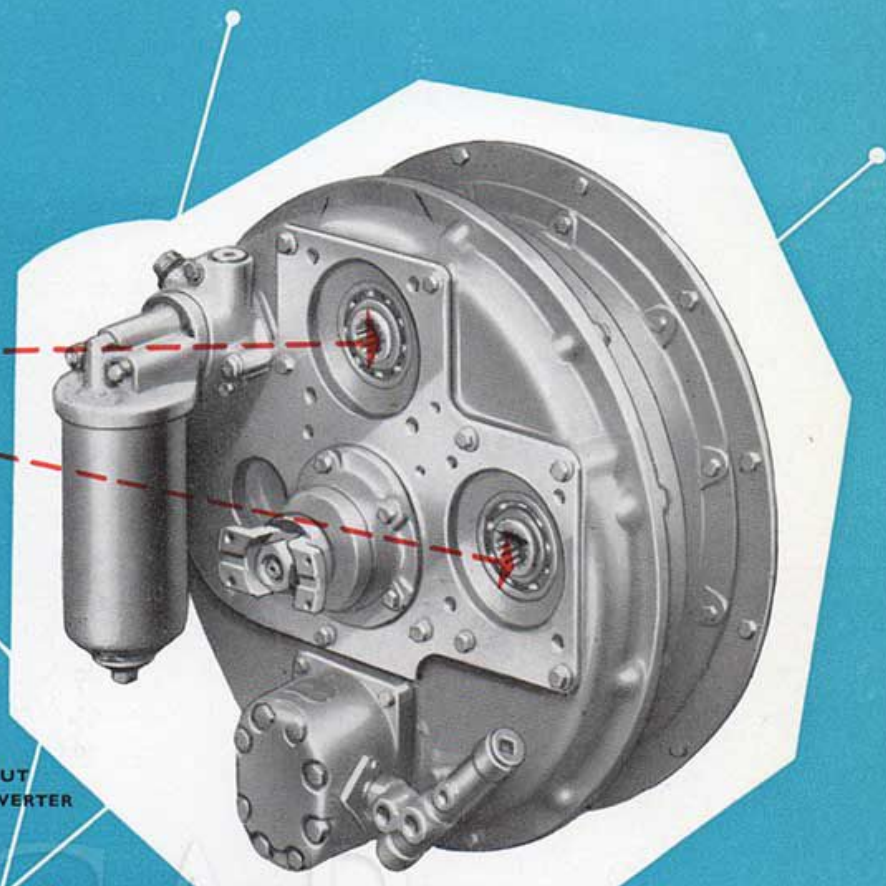


**WITH ENGINE
DRIVEN
POWER TAKE-OFF**

RANGING FROM 20 TO 250 H.P.
3:1 TORQUE MULTIPLICATION

CENTRE OUTPUT
TORQUE CONVERTER



HYDRAULIC TORQUE CONVERTERS

TYPES D. AND D.F.
TYPE D. PURE TORQUE CONVERTER
TYPE D.F. CONVERTER COUPLING

12" }
13" }
14" } 20 - 250 H.P.
15" }
16" }



SELF-CHANGING GEARS LIMITED

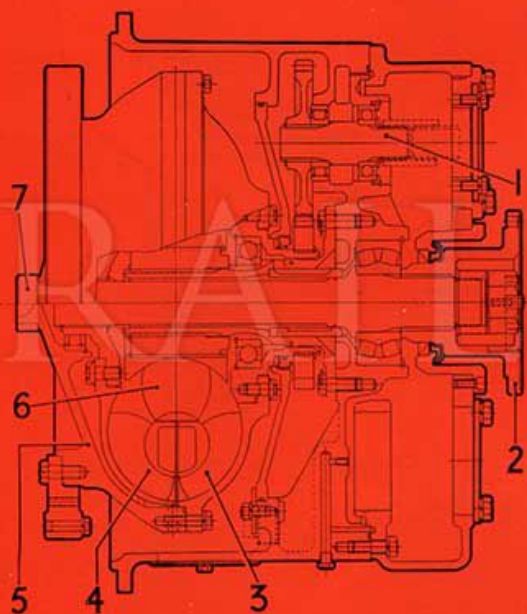
GENERAL DESCRIPTION

The Self Changing Gears Ltd., converter based on the Schneider system is an automatic hydraulic transmission with variable speed and torque ratios. The D.F. type combines a hydraulic torque converter and a hydraulic coupling into a single unit, while retaining the advantages of each. Transition from the converter range to the coupling range is effected automatically by the inherent characteristics of the unit, no outside controls being required. This combination makes it possible to operate at high

efficiencies over a wide speed range, and to obtain high output shaft speeds, permitting full utilization of the engine horsepower throughout the entire range of part throttle to full throttle operations.

Main functional parts, as shown in the section drawing, are the converter pump (sometimes referred to as the impeller), the converter turbine, and the reaction member. These are single piece aluminium castings with blades or vanes which direct the flow of oil in the hydrokinetic system.

Engine power is transmitted from the flywheel through the input shaft and pump cover to the converter pump. The turbine is mounted opposite the converter pump and, by means of a splined hub, is attached to the output shaft. The reaction member is mounted between the converter pump and turbine. It receives the oil after it leaves the turbine and re-directs it into the pump. The function of the reaction member is to increase torque in the converter range. In the coupling range no torque increase is desired and therefore the reaction member is arranged to be inoperative during this phase. This effect is attained by mounting the reaction member on the stationary sleeve by means



- 1 POWER TAKE-OFF
- 2 OUTPUT COUPLING
- 3 PUMP
- 4 TURBINE
- 5 PUMP COVER
- 6 REACTION MEMBER
- 7 INPUT

of a freewheel unit. This permits rotation of the reaction member during the coupling range and prevents rotation during the torque converter range. Whether or not the reaction member rotates depends upon the direction in which the oil leaving the turbine impinges against its blades.

The converter is kept filled with oil under pressure by an oil pump. The oil pump is mounted on the rear wall of the converter housing providing for easy accessibility.

Single or Twin auxiliary engine driven power take-offs are available, being taken from the engine via the spur gear attached to the converter pump wheel.

ADVANTAGES

The converter will multiply torque up to a maximum of three to one. This torque multiplication gradually decreases to one as the load requirements decrease. With further increase in speed the unit acts as a hydraulic coupling and the torque ratio remains constant.

Torque converters enable an engine to keep running at a constant speed in spite of variable load conditions.

They provide an exceptionally smooth take-up of load.

They utilize maximum horsepower through a wider working range which means a working

efficiency increase. They make engine stall impossible.

They obviate severe shocks to the engine and act as a cushion between the load and the engine.

APPLICATIONS

Torque converters are used for applications in the industrial, tractor and earth moving fields. Where drivers are constantly being called upon to accelerate a load from rest they are particularly applicable.

They are ideal for industrial lift trucks, shovels, front end loaders, bucket loaders, road rollers, locomotives, railcars, logging equipment, etc.

PRINCIPAL ADVANTAGES

Simplest single stage torque converter, low charging pressure, no complicated oil seals.

Increases work from 10—40 per cent.

Longer life for clutches, cables, engines, gears, etc.

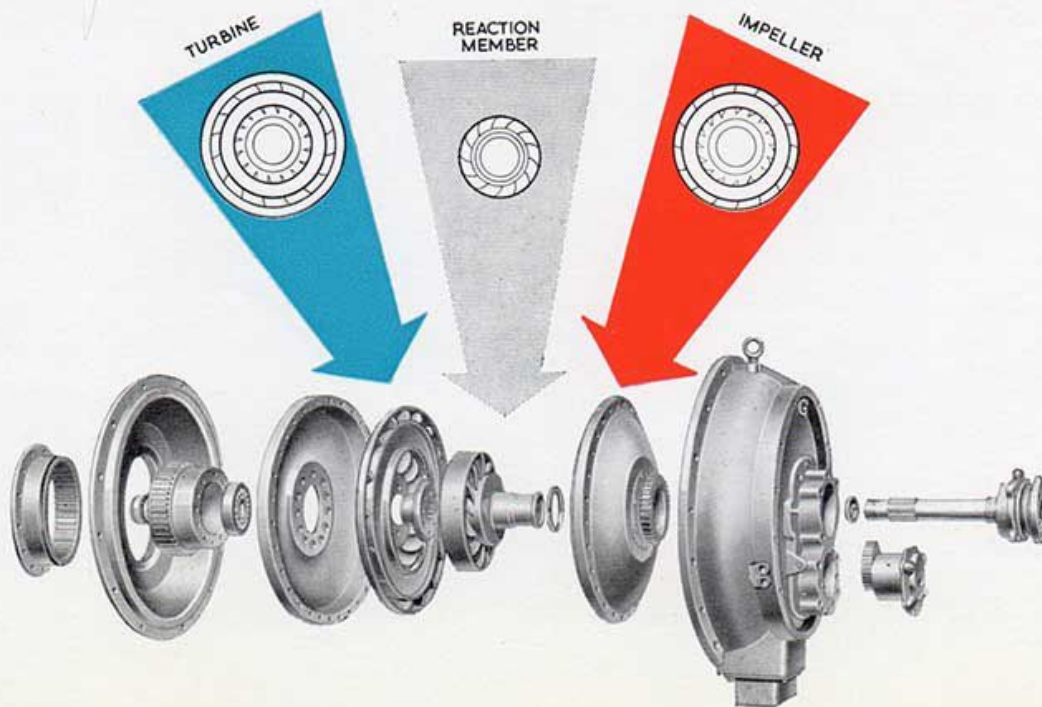
Maximum engine horsepower available when it is needed, that is at starting.

Reduces operation fatigue

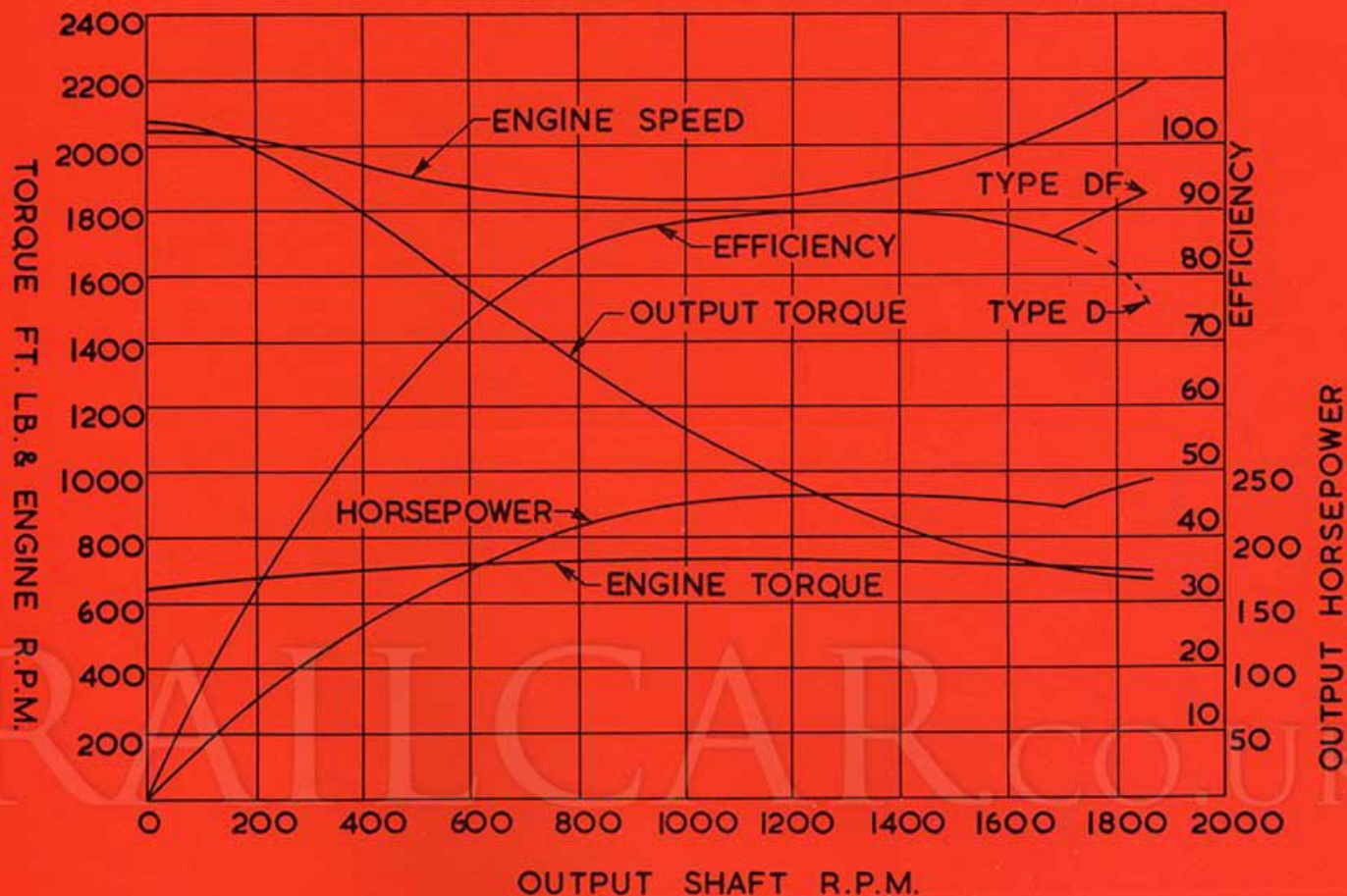
Prevents engine stall

Reduces maintenance on moving parts.

Smooth acceleration, elimination of excessive wheel and tyre slippage.



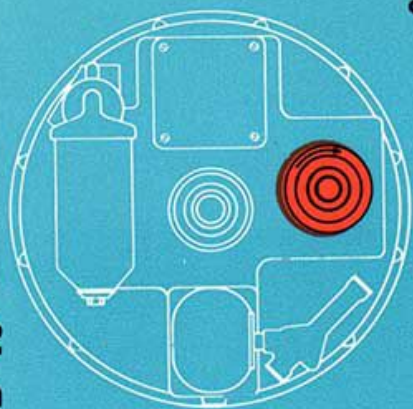
TYPICAL PERFORMANCE CURVES



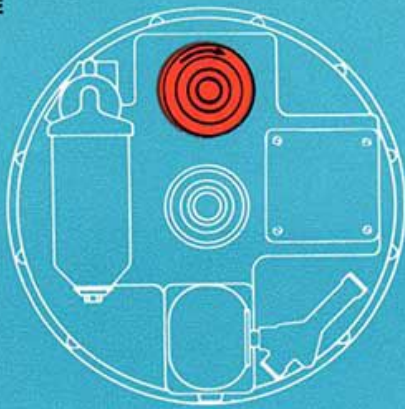
SPECIFICATION

WHEEL DIAMETER	12"	13"	14"	15"	16"
ROTATION	Clockwise (Looking on Input end)	Clockwise (Looking on Input end)	Clockwise (Looking on Input end)	Clockwise (Looking on Input end)	Clockwise (Looking on Input end)
INPUT TORQUE	220 lb/ft	270 lb/ft	300 lb/ft	400 lb/ft	600 lb/ft
INPUT SPEED	2,400	2,400	2,250	2,100	2,000
TORQUE MULTIPLICATION RATIO	2.82:1	3.1:1	3.1:1	2.8:1	3:1
NO. OF ELEMENTS	3	3	3	3	3
NO. OF STAGES	1	1	1	1	1
OIL PRESSURE	30 PSI	30 PSI	30 PSI	30 PSI	30 PSI
MAX. OIL TEMPERATURE	275°F	275°F	275°F	275°F	275°F
FLYWHEEL HOUSING	No. 2 or 3 SAE	No. 2 or 3 SAE	No. 1 SAE	No. 1 SAE	No. 1 SAE
OIL COOLER CAPACITY	Average conditions 25% of Input H.P.	Average conditions 25% of Input H.P.	Average conditions 25% of Input H.P.	Average conditions 25% of Input H.P.	Average conditions 25% of Input H.P.

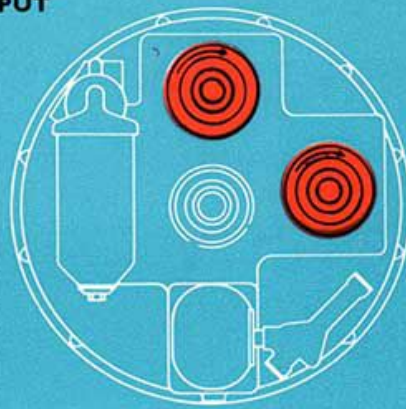
12" AND 13"



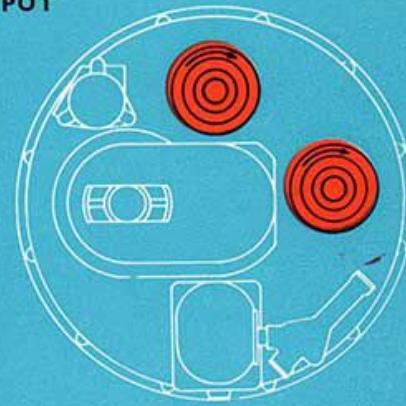
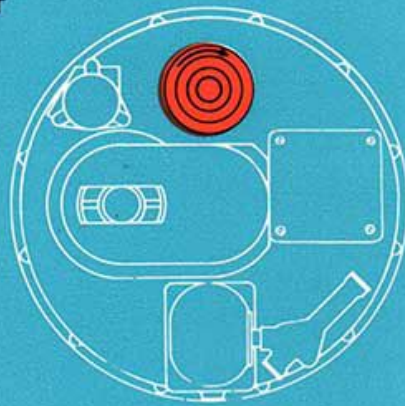
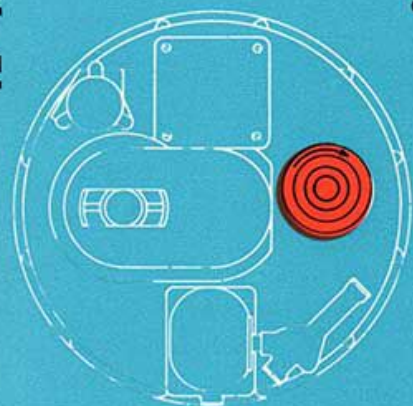
CENTRE



OFF-SET



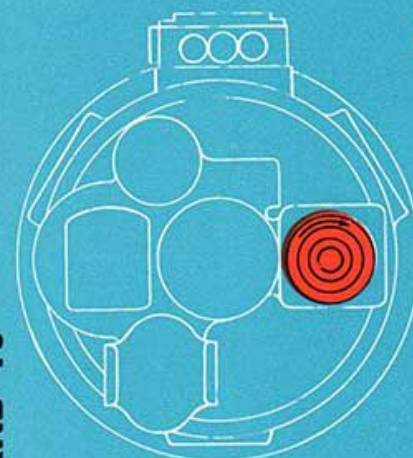
OUTPUT



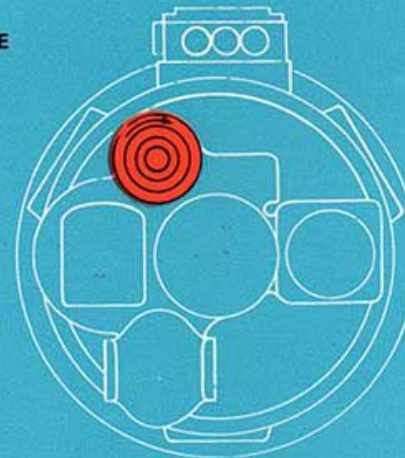
**POWER
TAKE-OFF DRIVES
AVAILABLE**

All the power-take-offs have SAE involute spline bores, and are arranged to form a convenient drive for hydraulic pumps to operate units such as power-steering and rams, and also to provide a direct drive for various ancilliary equipment.

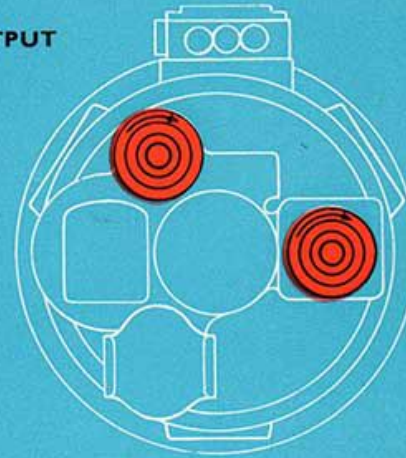
14" 15" AND 16"



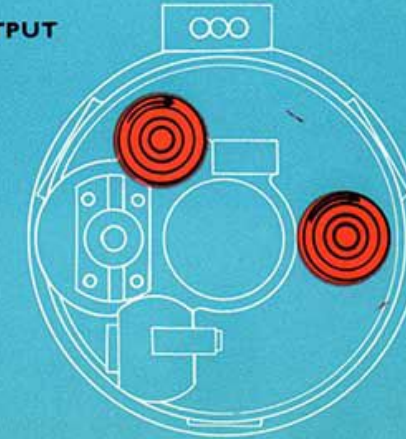
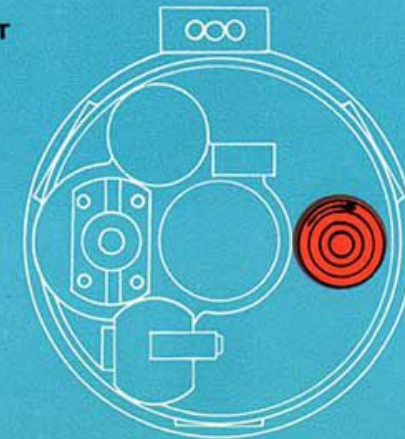
CENTRE



OFF-SET

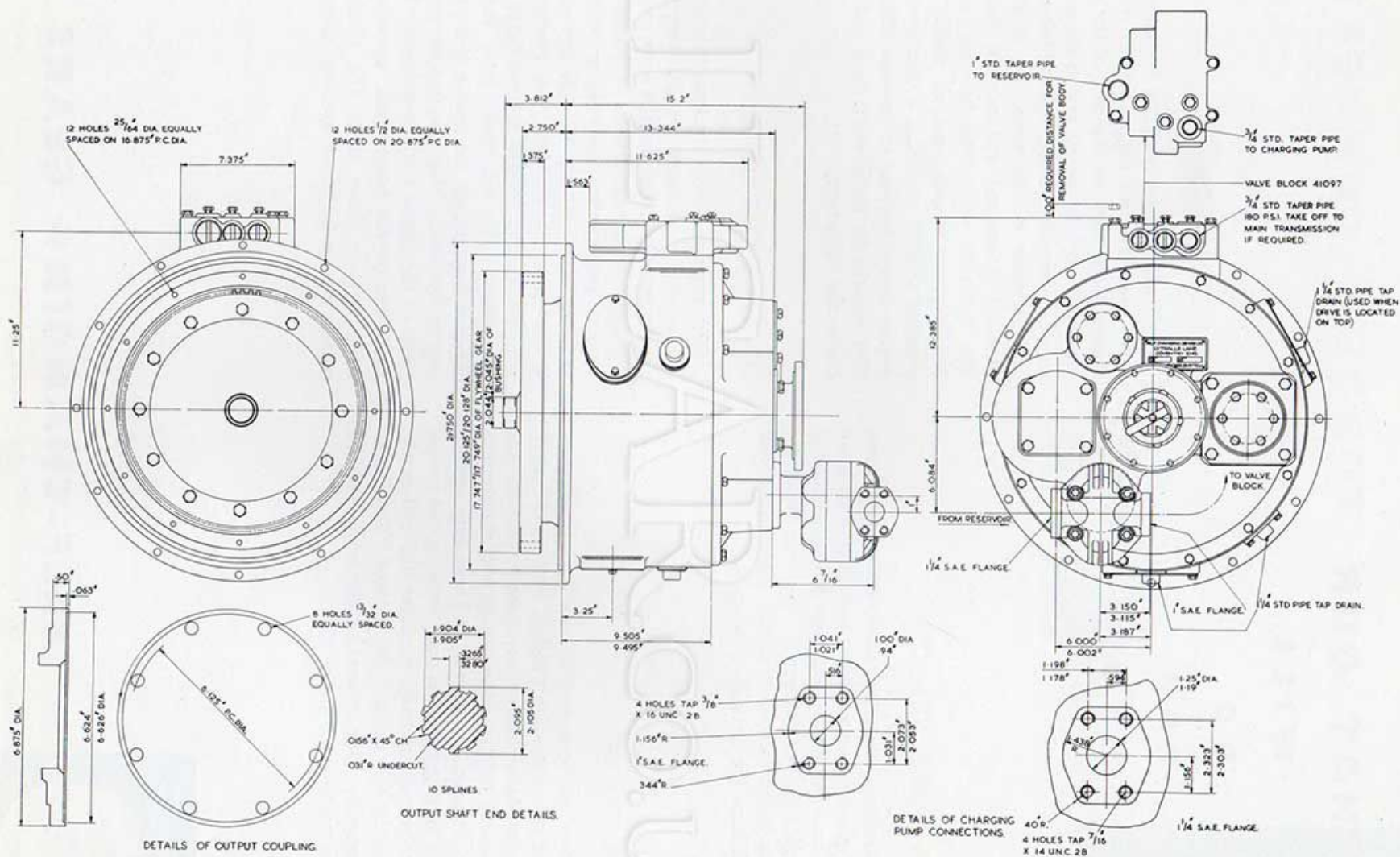


OUTPUT



OUTPUT

INSTALLATION OF 14" 15" & 16" TORQUE CONVERTERS



WHAT OUR TORQUE CONVERTER

WILL
DO
FOR
YOU

IN A ROAD VEHICLE

Operations requiring continual stopping and starting over steep gradients and rough terrain are more economical and faster when power is delivered through a torque converter. The tyre life of the vehicle is increased and clutch, transmission and axle failures are virtually eliminated.

IN A CRANE

"Force without motion" is an advantage of torque converters for winches, hoists and cranes. The automatic torque adjustment permits the operator to hold a load in mid-air with the throttle alone, without "bobbing". In heavy duty service, such as logging yards and dock working, the torque converter automatically increases line pull as the load causes line speed to be reduced. Once again the smooth pick-up ensures a faster work cycle and longer machine and engine life.

IN A TRACTOR

Maximum drawbar pull can be achieved at all times over the most rugged terrain without gear change guess work on the part of the driver. In "pusher" work he merely makes contact with the scraper, opens the throttle full and relaxes. As the load increases or decreases, the varying torque required is selected and exerted automatically. The hydraulic connection between driving and driven parts, smooths out all shocks and jolts, provides smooth consistent acceleration, with the engine always working in its most efficient range. This ensures far more work done and far longer life for the equipment.

IN AN EXCAVATOR

Excavators and other equipment which combine operations such as hoisting and swinging, etc., also benefit from the uninterrupted work cycle obtained through a torque converter. A power shovel for example requires maximum power whilst hoisting, etc., but requires only 10—20 per cent of that power to swing the load. A mechanical drive provides a very limited torque range for these operations. For the heavy jobs, the operator depends largely upon the inertia of the mass of the engine flywheel. This can impose severe shock loads on the engine and transmission. The torque converter on the other hand, smoothly delivers from two or three times the effective prime mover torque for these arduous operations.



SELF-CHANGING GEARS LTD

MAKERS AND PATENTEES OF WILSON GEARBOXES

LYTHALLS LANE . COVENTRY