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SERVICE BULLETIN #59

DATE: April 10, 1995

TO: All Midship, Light Truck and Service Center Customers

FROM: Joe Costello, Service Manager

SUBJECT: ITEM #1:

- Change to all new Hale Midship Pumps; each will have a new Dual Shift Indicator Assembly with two switches. (NOTE: This dual shift indicator switch assembly is also available for retrofit on most existing Hale gearboxes currently in service.)

ITEM #2:

- A new Gearbox Shift Indicator Switch (a single switch) is now available for retrofitting existing gearboxes having a single switch shift indicator.

Hale fire pump split shaft transmissions, used on midship and midi pumps with ratings from 500 to 2000 GPM have been supplied with a single Hale shift indicator assembly and switch. This single switch was only historically intended for operating the Hale pump engaged indicator lamp that is provided with the Hale fire pump. Against Hale recommendations, some OEM builders have wired in other electrical components through this switch (i.e., automatic transmission lock-up or throttle/governor interlocks) which causes the switch to fail due to electrical load. This has led Hale to provide a new dual shift indicator assembly with a dual switch arrangement. Hale now also provides a recommendation for a relay that will allow electrical interlocks to be tied in without overloading this new second switch.

In April 1995, all new HALE split shaft pump transmissions (with the exception of those controlled by military specifications) will receive this new shift indicator assembly with dual switches. This shift indicator assembly on new Hale pumps will include two completely independent shift indicator switches. These are from a new supplier and designed for use in transmissions with sealed contacts and connections. One switch is to be used for transmission lock-up and other OEM safety interlocks, the second switch is for the standard pump engaged indicator

lamps. This will provide two independent switch systems to help prevent contact overloading and electrical problems (when wired per Hale recommendation) with shift indication on split shaft transmissions. This will help OEMs meet upcoming NFPA 1901 revisions regarding pump shift interlocks.

ITEM #1. APRIL 1995

THE NEW HALE GEARBOX SHIFT INDICATOR ASSEMBLY HAS TWO INDEPENDENT SWITCHES

FIRST SWITCH CONTACT is for the OEM-provided interlocks, per NFPA 1901 (i.e. parking brake, transmission throttle, and engine controls, as applicable). Follow the Hale indicator switch relay recommendations that are included on the second sheet of the attached indicator switch installation instructions.

SECOND SWITCH CONTACT is for the HALE-provided components for the green pump engaged indicator lights.

While every new Hale Midship Pump will be shipped with this new assembly, this new dual shift indicator with two switches is also available for retrofit on most older Hale split shaft gearboxes. Please read the attached instruction sheet.

ITEM #2. RETROFIT OF EXISTING SINGLE SWITCH ASSEMBLY FOUND ON HALE GEARBOX WITH NEW (SINGLE) SWITCH

The new type of switch discussed in Item #1 (less shift assembly) can be retrofitted to existing gearboxes. Even though there will still be only a single switch after the retrofit, by following the attached instruction sheet and using a relay coil, other contacts may be tied into the switch (provided voltage and amperage are within the recommended switch envelope). Follow the attached, detailed retrofit installation instructions for retrofitting the new switch to Hale pumps now in service. A switch can be ordered in a kit (Hale P/N 546-1590-00-0) for retrofit purposes.

It is imperative that the attached instructions for switch installation and electrical relay recommendations are adhered to by the OEM installer when installing the new switch for retrofit purposes. If there are any questions, please feel free to call the Hale Service Department.

Regards,

Joe Costello

Joe Costello, Service Manager

Attachment
jc/SERVICE BULLETIN #59

SHIFT INDICATOR SWITCH
REPLACEMENT KIT INSTALLATION

HALE

WARNING: Any electrical system has the potential to cause sparks during service. Take care to eliminate explosive or hazardous environments during service/repair.

1. Turn off apparatus master power switch or disconnect the main power feed. Manually move gearshift shaft to the pump position.
2. Drain oil from gearbox
   a. Place container with suitable capacity [3 to 4 quarts (3 to 4 liters)] under gearbox drain plug.
   b. Remove gearbox drain plug and allow oil to drain into container.

   NOTE: The oil may drain faster if the level plug is removed.

   c. Replace the plugs that were removed.
   d. Dispose of waste oil properly.

   CAUTION: The new shift indicator switch will not work properly with the existing gearshift shaft cap. All existing shift indicator switch components must be replaced with those provided in the kit.

3. Remove existing shift indicator switch components.
   a. Gain access to gearbox and shift indicator switch.
   b. Disconnect wires from switch.
   c. Using ¼ inch Allen wrench, loosen the ½-20 x ½ inch long setscrew to release tension on the gearshift shaft lock spring.
   d. Note the orientation of the gearshift shaft cap then remove the $^{7}/_{16}$-14 x 1 inch long cap screw and $^{7}/_{16}$-14 nut that secure the gearshift shaft cap to the gearbox. Retain the nut and cap screw for reassembly.
   e. Remove gearshift shaft cap and attached components from the gearbox. Discard the gearshift shaft cap and attached components.

4. Clean gearshift shaft cap gasket sealing surface on the gearbox.

5. Install new shift indicator switch components.
   a. Apply light coat of grease to gearshift shaft cap gasket.

   NOTE: All nuts and cap screws must be locked in place using a suitable thread sealing compound (Loctite #242 or equal)

   NOTE: If the $^{7}/_{16}$-14 nut and cap screw require replacement they shall be replaced only with grade 5, zinc plated steel type.

   NOTE: If installing the two switch assembly it is necessary to insert the gearshift cap stud into the hole on the gearbox where the cap screw was removed. Apply a light coat of Loctite #242 or equal thread sealing compound to the threads on the stud before installation and torque stud to 40 lb-ft (54 N-m).

   b. Install gearshift shaft gasket, and gearshift shaft cap and switch assembly. Make sure the shaft ball and lock spring guide is facing in the same direction as removed. Secure gearshift shaft cap and switch assembly and gasket to gearbox using the $^{7}/_{16}$-14 x 1 inch long cap screw and $^{7}/_{16}$-14 nut(s). Tighten the nut(s) and cap screw to 40 lb-ft (54 N-m)
   c. Insert the gearshift shaft ball and then the lock spring into the ½ inch hole on the gearshift shaft cap.
   d. Install ½-20 x ½ inch long setscrew and tighten using ¼ inch Allen wrench. Tighten setscrew until the top of the setscrew is flush with the gearshift shaft cap.
   e. Connect electrical wires to the connector provided. Installer may provide Packard Weather Pack mating connector; Terminal #12010085, Connector #12010973 and Seal #12015359 for this connection or the connector may be cut from the switch and any appropriate sealed connector used.

6. Fill gearbox with oil.
   a. Remove oil fill/level plug
   b. Add approximately 3 to 4 quarts (3 to 4 liters) SAE EP-90 or API GL5 80W-90 oil through fill/level plug opening until oil flows out of level plug hole.
   c. Install fill/level plug.

7. Test shift switch operation while observing PUMP ENGAGED indicator light in the driving compartment.

8. Return apparatus to normal operation.

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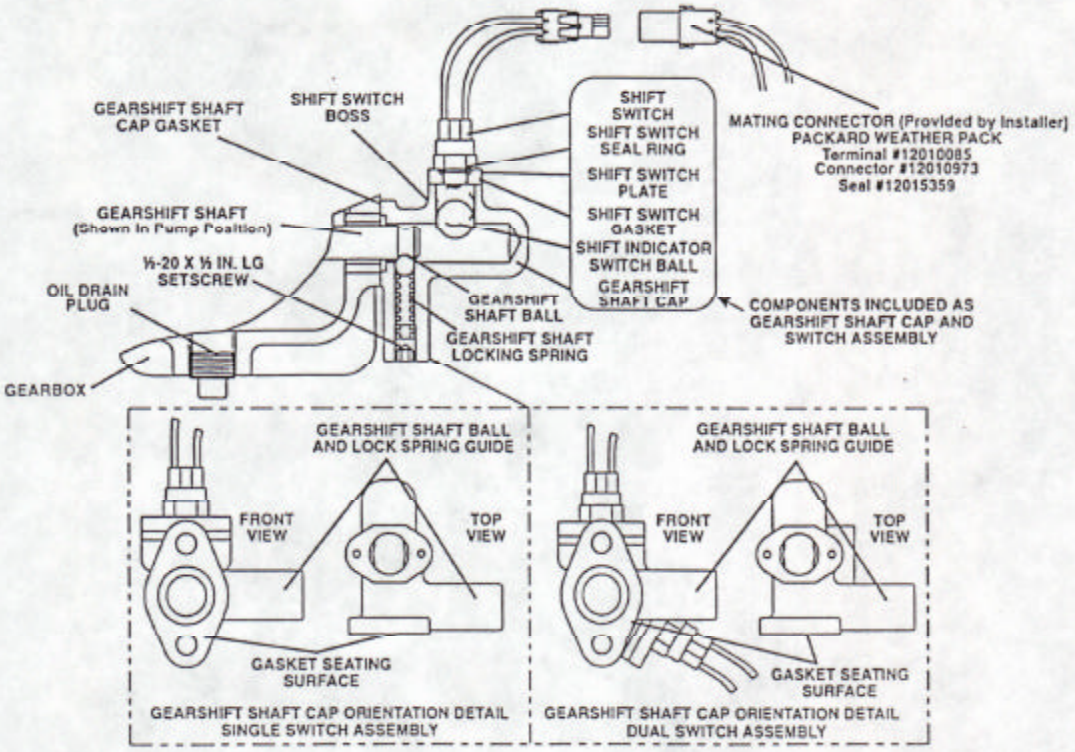
IDEX CORPORATION

HALE CODIVA

The Hale shift indicator switch is used to actuate the "PUMP ENGAGED" indicator light located on the driving compartment panel only. The switch SHALL NOT be used directly to achieve automatic transmission lock-up or actuate other indicator lights. The switch can be used to actuate relay coil(s) providing completion of electrical circuits in conjunction with other interlock switches for the "OK TO PUMP" and "WARNING, DO NOT OPEN THROTTLE UNLESS LIGHT IS ON" indicator lights as well as transmission lock-up and parking brake interlocks.

When a relay is placed into the circuit controlled by the shift indicator switch the maximum load limit of the switch (4 AMPS at 12 VDC) must not be exceeded by the light and relay coil(s). It is recommended that a single Potter-Brumfield P/N VF4-1511 Automotive SPDT relay (Form C) be used. If multiple relays must be connected use Potter-Brumfield P/N VF4-1511-SO1 suppressed coil relay. It is up to the OEM installer to provide the proper brake, transmission and engine safety interlocks. The relays listed above are readily available and provide both normally open and normally closed contacts.



SHIFT INDICATOR SWITCH REPLACEMENT KIT COMPONENTS
SINGLE SWITCH KIT P/N 546-1590-00-0
TWO SWITCH KIT P/N 546-1590-02-0

PART NUMBER	DESCRIPTION	SINGLE SWITCH KIT QUANTITY	TWO SWITCH KIT QUANTITY
005-0830-01-0	SHIFT INDICATOR SWITCH PLATE	1	2
008-0052-00-0	GEARSHIFT SHAFT CAP	1	
008-0052-02-0	GEARSHIFT SHAFT CAP		1
018-1106-02-0	#10-32 x ¾ INCH LONG HEX HEAD CAP SCREW	2	4
018-2104-61-0	½-20 x ½ INCH LONG FLAT POINT SETSCREW	1	1
018-8040-00-0	GEARSHIFT CAP STUD		1
039-0050-00-0	GEARSHIFT SHAFT BALL	1	1
039-0180-00-0	SHIFT INDICATOR SWITCH BALL	1	2
040-0140-00-0	SHIFT INDICATOR SWITCH SEAL RING	1	2
042-0060-00-0	GEARSHIFT SHAFT LOCK SPRING	1	1
046-0950-00-0	SHIFT INDICATOR SWITCH GASKET	1	2
046-5060-00-0	GEARSHIFT SHAFT CAP GASKET	1	1
110-1800-02-0	7/16-14 STEEL NUT		1
200-2450-00-0	SHIFT INDICATOR SWITCH	1	2